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Entered as second class matter at the post office at Baltimore, Md., under the Act of August 2, 1912.
Accepted for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1919, authorized January 22, 1932.
Publication Office: Monumental Printing Company, 32nd Street and Elm Avenue, Baltimore 11, Md.
Editorial Office: 1537 35th Street, N. W., Washington 7, D. C.

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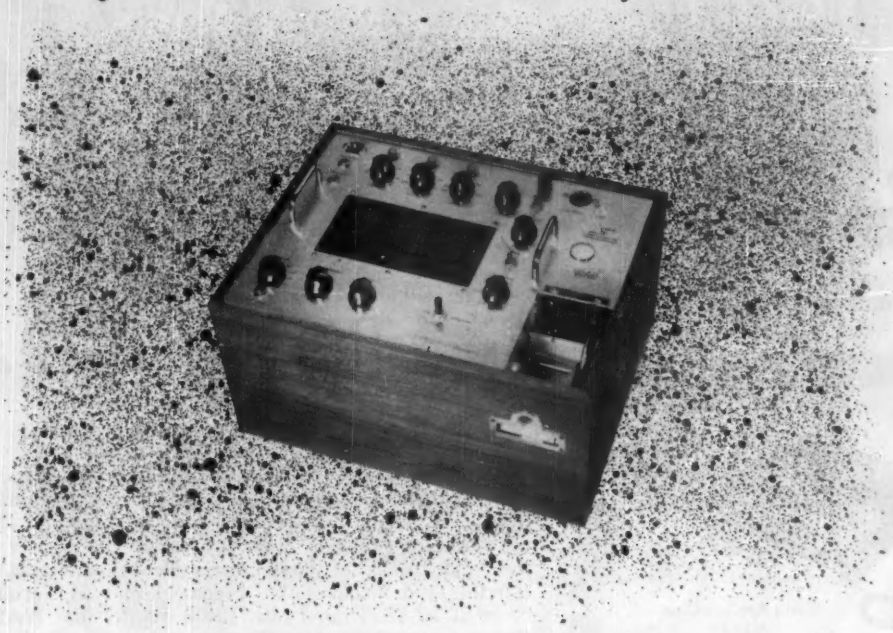

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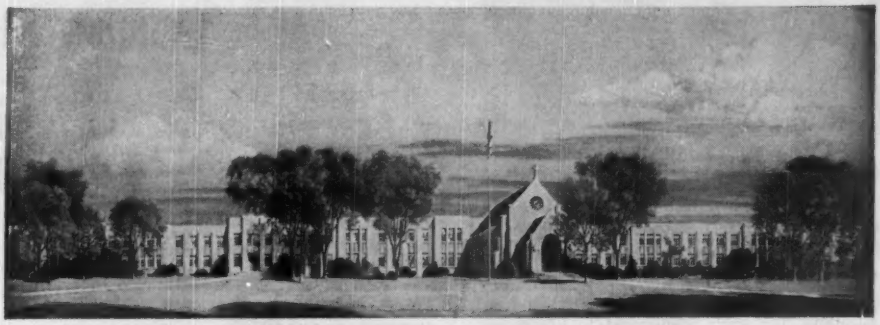

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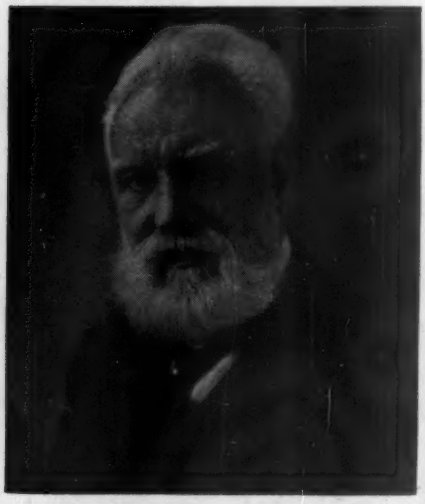
THE ALEXANDER GRAHAM BELL ASSOCIATION FOR THE DEAF welcomes to its membership all who are interested in improving the education of the deaf and the hard of hearing, their ability to communicate with those who hear normally, and their adjustment to life in the hearing world. Its membership fee ($5 a year—$100 for life) includes a subscription to *The Volta Review*. Those wishing to lend additional support to the work of the Association may become sustaining members for a fee of $10 per year.

THE VOLTA BUREAU, headquarters of the Association, is an information center about deafness, founded by Alexander Graham Bell in 1887. Its library on deafness and speech is probably the largest in the world, containing books in twenty or more languages.



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THE VOLTA REVIEW

ALICE DUNLAP, EDITOR

PUBLISHED BY THE ALEXANDER GRAHAM BELL ASSOCIATION FOR THE DEAF, INC.

1537 35TH STREET, N.W., WASHINGTON 7, D. C.

VOLUME 58 NOVEMBER 1956 NUMBER 9

Copyright, 1956, by the Volta Bureau, Washington 7, D. C.

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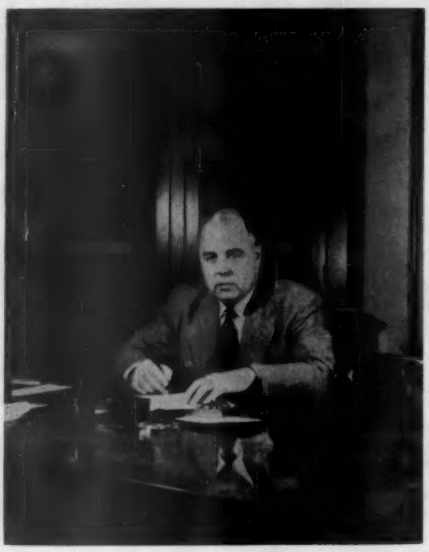
COVER

The cover photo was taken at Mill Neck Manor, Mill Neck, N. Y. The school, which is residential, was founded in 1951 by the Lutheran Friends of the Deaf and now has an enrollment of approximately 65 pupils. All teaching is oral.

Edward Marvin Twitmyer

DR. Edward M. Twitmyer, Headmaster of the Pennsylvania School for the Deaf, Philadelphia, died suddenly of a heart attack on October 6, 1956. The loss of this fine educator is a great tragedy to his family, his school faculty, the profession at large, and particularly the Volta Bureau and the Alexander Graham Bell Association for the Deaf.

Dr. Twitmyer was elected to the Association's Board of Directors in 1953, after serving on the Auxiliary Board for a period of four years. He was re-elected to the Board in 1955 for a three-year term, became Second Vice President of the Association in January 1955 and was re-elected to that office in January of this year.



Perhaps Dr. Twitmyer's greatest service to the Association was in the field of finance. His four years of service on the Finance Committee were instrumental in bringing about many profitable administrative and budgetary changes in the day-to-day work at the Volta Bureau. He was a valued officer and member of the Board of Directors, taking an active part in the management of the Association. All of his efforts, including attendance at Board and Committee meetings, were at his own personal expense.

Since this issue of the *Volta Review* was in the hands of the printer at the time news of Dr. Twitmyer's death was received, tributes to him will be published in December. A message from President Clarence D. O'Connor, written in behalf of all members of the Association, will also appear at that time. This short statement, then, is included to express the feelings of members of the staff of the Volta Bureau and the Association.

Dr. Twitmyer was a person who never failed to respond to requests for advice and counsel. As a consequence he was called upon frequently. Those of us at the Volta Bureau came to know him well during his term of service as an officer and director of the Association. We considered him our friend and are deeply grateful for his constant help and encouragement. We will miss him.

ALICE DUNLAP
Executive Secretary

They Can't Help But Read

A Keynote Address at the 1956 Summer Meeting Alexander Graham Bell Association for the Deaf

SISTER ANNA ROSE

YOU believe it! So do I! You have faith! And so have I! Our presence here this afternoon evidences our belief—belief in the fact that deaf children can and do learn to read and faith that, having learned to read, they will read to learn.

You and I, as teachers of deaf or hearing children, as teachers of reading, of language, of arithmetic or any other subject, must, in order to succeed, set a goal toward which to work, keep sight of that goal as we work, and attain the goal by planned, directed and concerted effort.

We learn to read in order that we may read to learn. Why then do we read? To learn. Reading to learn! This, then, states our purpose in teaching reading, sets the goal for which we work, and which, with the help of God, we will attain.

Having established our goal, we must now decide how to reach it. From past experience we realize that basic to all learning, to all goal-directed behavior, is the decisive factor of motivation without which there would be no progress. Motivation, in turn, is energized by the attitudes of the teacher, the pupil, the parents.

The attitudes that must live in the teacher, if there be any hope of success, are those of confidence, enthusiasm and love. It is wise, therefore, to supply ourselves with healthy attitudes toward everything, but particularly toward our children. We do this by looking for that which we know without doubt exists, the ability of deaf children. Look for it. It is there. You will find it, and in finding it you will confidently teach your children with enthusiasm and love.

A long time ago a wise old nun told me the ingredients she had found to be right and necessary for success in any venture. "Love and skill," she said. How right she was! The years have proved it so. Love effects happy, encouraging, patient teachers. For all things are easy for the one who loves. Skill effects relaxed, confident and again patient teachers. For how could we be other than relaxed when we know what we are doing? And how could we be other than confident since confidence, we know, is the remembrance of past successes? And how could we be anything but patient when we are so sure of success? The deaf child will read to learn.

Having considered the attitudes necessary for successful teaching, we now consider the attitudes necessary for successful learning. Needless to say, they are the same—confidence, enthusiasm and love. If these attitudes live in the teacher, not only will they live in the learner, but they will have been put there by the teacher, developed by the teacher, to be utilized by the teacher. Pupil attitudes, then, are ours —our joy, it is true, but also our responsibility. As teachers we hold in our hands a creature of God to be molded and fashioned as we desire. And we do mold him. Our attitudes become his attitudes, our work habits his work habits, our ways his ways. In a word we become a pattern, and a pattern of a happy, relaxed, interested teacher fashions a replica of a happy, relaxed, interested child. Thus it is that the children we teach become our children, as each day we add to their stature by giving of ourselves.

Our pupils' parents are a third factor to be considered in engendering proper attitudes to encourage and expedite learning. If our attempts at teaching the deaf child are to meet with any kind of success, parents must, if possible, reinforce our guidance of their children. This involves two things—convincing the parents of not only the possibility but the probability of their child's success in learning to read, and con-

Sister Anna Rose is principal of the St. Joseph Institute for the Deaf, University City, Missouri and an Auxiliary Director of the Alexander Graham Bell Association for the Deaf. This was the keynote address for the panel discussion of "Problems and Methods in Teaching Reading," presented on June 18, 1956.

vincing them of their part in the attainment of this success. Parents who are aware of the important part they play in the education of their child, will assume some responsibility in securing their child's best efforts in utilizing his God-given ability.

Demonstrations at PTA Meetings

To acquaint parents with these facts, we use our PTA, at which we demonstrate, through actual classroom teaching procedure, the methods used in the classroom situation. Through subsequent discussion at the meeting we clarify any doubts which may exist or problems which may have arisen. Our out-of-town parents are kept informed, in detailed account, by a newsletter which is issued following each PTA meeting. This, then, is the means we employ so that parents may become cognizant of their part in the development in their child's attitude toward reading. Thus, too, parents will grasp any opportunity which presents itself in teaching their child to read, such as reading a menu, a score card, a time table, a want ad, signboards or headlines. All are reading situations which would be rather difficult for classroom presentation, but which, through incidental teaching in meaningful situations, contribute in no small measure to a deaf child's learning to read. The parents, then, expect their child to read, encourage him to read, provide time and material for him to read, and these supply the attitudes of confidence, enthusiasm and love; thus we see the unifying forces of parents, teacher, and child's attitudes, providing and sustaining motivation toward the goal of reading to learn.

For the child who is deaf, as well as for the child who hears, tremendous strides in reading mark tremendous strides in mental development, strides which open up to him new and vast horizons in the world of nature, science, sports and literature.

Proficiency in reading fosters social adjustment, wherein a child who is deaf, by feeling his ability to see and learn practically everything his hearing brothers and sisters do, becomes acceptable to himself, as well as others, because he has arrived at the mental, moral and psychological goals of reading to learn, and has, thereby, attained secure happiness.

In the past, reading has met these goals inadequately. In recent years, however, educators have thoroughly investigated this inadequacy; their penetrating research proved so profitable that the results are now being used to enrich our reading programs. As teachers, regardless of our specialization, we should and do use their findings to fullest advantage. How do we use these findings to reach our goal which, as you recall, is reading in order to learn? Let us examine for a moment some points in this area, for example, *standard textbooks*.

Use of Standardized Textbooks

Should we, who are teachers of deaf children, use the same type textbooks used by all other teachers, particularly teachers of hearing children? By all means, yes. These texts are the result of years of work in revamping, grading and systematizing material, work accomplished by the greatest educators of our time.

In standardized textbooks we find purposeful stories, *interestingly written* in language geared to the grade level. We strive for normal language; here we find it. Why look further, why try to write stories when such a wealth of splendid reading matter is at hand?

In standardized texts, also, we find humorous and fanciful stories which have been found to be necessary for hearing children to develop normally. If this is true for a hearing child, how much more must it be true for a deaf child whose sense of humor lies dormant for many years until it is awakened by training?

Furthermore, in standardized texts we find stories written in graded vocabulary. Some might say that vocabulary commensurate with grade level is too difficul.t With these we would not agree, for three reasons. At St. Joseph's we find, by putting standardized textbooks into the child's hands very early, beginning with the first pre-primer, that the vocabulary handicap is never encountered; by including in the daily program a word-building period, that the danger of vocabulary proving a handicap is considerably lessened; and the third reason—by teaching the skillful use of the dictionary and the glossary, that the vocabulary handicap does not exist.

We can cite as another argument in

favor of using standardized textbooks, the fact that children will be better prepared to enter high schools where standardized textbooks are used.

And lastly is the fact that through the use of standardized texts, the teacher may avail herself of the excellent manuals and workbooks printed to accompany them. Such a help constitutes no small item in teaching.

Do, then, use standardized textbooks with their dynamic illustrations, well-organized manuals, and specifically arranged workbooks. Do then, start standardized textbooks early, build necessary vocabulary, develop dictionary habits and you will soon have children learning to read—in order that they may read to learn.

Audio-Visual Aids

We are further indebted to the great educators of our day for another most vital contribution of a way to meet our goal—audio-visual aids.

It is axiomatic that there is nothing in the mind which was not first in the senses. We must, then, make use of visual and auditory opportunities.

Visual immediately brings to the mind the filmstrip, a storehouse of reading material, and the movie, be it educational as well as entertaining. Important to note here is the necessity of previewing the movie, lest the whole impact of it be lost. Without stopping for further treatment of filmstrips or movies, but with no intent to lessen their importance, it seems right at this time to bring from their humble oblivion our most invaluable visual aids—the blackboard and its first cousin, the bulletin board. Their abiding presence seems to have lessened their importance in our eyes and rendered us impervious to their worth. How can we underestimate these invaluable visual aids of blackboard and bulletin board, which we put in constant use for chalk-talk explanations of language constructions and idiomatic expressions? Without them them our explanations and illustrations would be ineffectual, indeed almost impossible. A teacher without a blackboard might be compared to a pilot without a plane. Let us not be deluded by proximity, and consequently blinded to the true worth of our oldest, finest, "helpfullest" friends, the blackboard and the bulletin board.

Another item high on our visual aid list is pictures. Pictures are frozen words. We see into pictures. We see "verbally" into pictures. Herein, then, lies our task in teaching the deaf child to melt the pictures into words and language that he too might see into pictures, might see "verbally" into pictures, and doing this, he might the more readily see pictures in words, he might the more readily, read.

Our list would not be complete without illustrations, whose aid to teachers is immeasurable. For instance, a drawing class might illustrate such feelings as fear, haughtiness or boredom by using simple mouth and eye lines. By using profiles the class might illustrate square jaw, receding jaw, projecting jaw, or pug nose, hooked nose, Roman nose. Then, when any of these terms is met in reading, it presents a picture to the mind. This means reading.

Everyone nowadays uses illustrations to ascertain whether or not the pupil has grasped the meaning. An extremely simple, yet efficacious method in illustration technique is that of employing stickmen as assistants. They can amble, saunter, strut, wander and meander—and very graphically. Then permit the child to illustrate the stickmen's antics through a mimicking performance of these same verbs. It is effective. Try it and see.

Teach your children analogy through illustration. Draw a picture of a school and a house. Place them within walking distance of each other so you can draw a little girl walking to school. There's a hole in the sidewalk. She falls into it on the way to school; but coming home she circumvents it. Wise girl! She doesn't make the same mistake twice! Only in the classroom. Then, when she is cautioned, "Don't fall into the hole!", she makes an analogy, a connection.

Another example of this would be:

"Do you know who Mickey Mantle is?"

"Yes, I know who Mickey Mantle."

"Oh, oh! You forgot to put the tail on the dog!"

Immediately the sentence is corrected to read:

"Yes, I know who Mickey Mantle is!"

Illustrations also include posters, maps, charts, exhibits and trips to the museum.

All of these illustrate extensively, thoroughly and pleasurably. Let us not neglect their possibilities, their vast potential. Rather let us use them to the fullest possible extent to make teaching easy and interesting for us and our charges.

The elasticity of illustration manifests itself as we continue with other practical uses of it.

Have you ever used an experiment to introduce and fix "typical" vocabulary? This method can be extremely enlightening and recalls to my mind a picture of an old turpentine can, flattened to the "discard" state, but glorified, for it had ably served its high purpose of impressing meaning and giving comprehension. We had used it to demonstrate the ability of steam to contract and expand.

Dramatization

What can we say for dramatization, except that we believe enough in its potential to require each class each year, from the second grade up, to prepare and present a play? Basic idioms and expressions are incorporated into each part. Much stress is placed on natural language. Consequently a child, with a gesture of despair, might afterwards be heard near his broken bike exclaiming, "I have no more patience.", or "Why does everything happen to me?"

Dramatization provides additional learning opportunities when the child is taught to read the directions of the script. Here he reads: "Walk to the center of the stage, look downhearted, slump into a chair—or perhaps shuffle over to the icebox, languidly select a stalk of celery and begin munching." And he does it.

Experience Stories

The use of illustration seems almost endless, but don't forget experience stories. Prepare them, then experience them. Let me tell you how we do it. I planned, with my class, a trip to New Orleans at Mardi Gras time. Such interest! Such enthusiasm! Such scurrying around to the encyclopedia to read avidly and extensively about the city we were soon to visit. What about the climate? That would decide our wardrobe. What about historical sights? Let's check them now and decide just which ones we will investigate. Excitement mounted as we figured the mileage, the cost, checked our expenses and finally bought our tickets.

Imagine, then, the thrill for the children when they visited the Cabildo Museum, wherein is preserved the prison where Lafitte had been boarded up, and where his weapons and the list of his fellow pirates can be found. They were merely renewing their acquaintance with Jean Lafitte, famous French pirate whom they had met not ten days before in the pages of our encyclopedia. How thrilling to walk down Pirates Alley, through which the pirates had fled, to see the statue of Andrew Jackson and the old St. Louis Cathedral with its cypress pillars! How thrilling, too, to spend a day on a plantation, another in the bayou country and still another on a steamer in the busy harbor! All this taught more than school ever could, with little time, less effort and much enjoyment.

Making trips to Washington, D. C., with the Capitol, Mount Vernon and the White House—and New York, with the Empire State Building, the Statue of Liberty and the United Nations' Headquarters—has become traditional with our children. Next year it will be Chicago, with its Museum of Science and Industry, its Planetarium and its Field Museum. In discovering educational trips we have discovered a veritable gold mine. Make an investment! It pays dividends!

Auditory Training

This brings us to the audio part in audio-visual. There are many ways to use tiny remnants of hearing. Through auditory training, reading to learn becomes an enjoyable half-hour. In the early stages, scroll cards with sentences listened to, looked at and often repeated, become the pupils own vocabulary. Use records, today so plentiful, so filled with natural stimulating vocabulary, to give your pupils concepts in a happy painless way. A chart, on which the words to the song are printed, is followed while the children listen. This is done over and over until it is learned. Soon we find portions of it being used correctly. For example, Eileen's mother asked her, "What did you say to Mrs. Schreiner for taking you to the store?" Little eight year old Eileen, who had been listening to the record *Two Little Magic Words*, mimicked:

"Thank you, you know manners are never out of style!" Then, too, songs have many fanciful expressions which the children learn to understand and use, such as "dreams in his pocket," and "rain clouds of daffodils," "open up your hearts and let the sunshine in."

Each of us has experienced the difficulty of trying to understand a poor reader, to get the thought when the wrong word is stressed or when no pause is made after a phrase. We have found that understanding is accelerated when the teacher, using proper phrasing and stress, reads into the "mike." If precaution is taken to be sure the pupils know the place and are following, comprehension is benefited. The greater majority of our children, with only tiny remnants of hearing, hear at least something. Even interpreting vibrations aids comprehension.

I cannot stress auditory training enough. We use it in varied ways continuously throughout our school day. Since we have been doing this we have, in our classrooms, more alert, more alive, more "hearing" children.

Educators have reminded us, too, that each time we read, we read for a specific purpose. It is our duty to make our pupils conscious of the purpose for which a selection is read, and to suit their style of reading to this purpose. These purposes include:

(a) Skimming for information, with emphasis on speed and the use of reference books.

(b) Answering specific questions, with the use of inclusive questions such as why, how, compare, evaluate.

(c) Observing details, which is least necessary for a deaf child because he does it without being taught.

(d) Just for telling the story which is wonderful, but difficult to teach the deaf child because of the length. An outline will help.

(e) Getting the general idea or main topic. Initially the teacher should write two or three sentences, allowing the child to choose the one which best summarizes the general idea.

(f) For pure enjoyment, which is our highest aim. Some do; some never do, but we can't stop helping them.

There is more, much more, to say about reading. There is so much more to do to make our pupils learn to read and therefore read to learn, but I will leave any further ramifications and amplifications to other speakers.

To sum up, we feel that with attitudes of confidence, enthusiasm and love, on the part of the teacher, the child and the parents, and with the use of standardized textbooks, modern techniques and audio-visual aids, the deaf child can't help but read. It will be a triumph of love and skill.

DON'T FIGHT DEAFNESS

"Earnest, I want you to succeed not in spite of your deafness, but on account of it. In short, don't fight it—use it." These were the words of Ida McCall which turned Earnest Elmo Calkins from a discouraged, rebellious boy and started him on a successful career which included attaining the appellation "dean of advertising men" before his retirement from his New York advertising agency. Miss McCall was his Latin teacher in Galesburg, Illinois, and her encouraging words led him to, in his own words, "become a master of the art of being deaf." With her help he finished high school. He graduated from Knox College and later he was successively an editor of a small town paper, free lance writer, journeyman printer and advertising manager of a department store before establishing his own advertising agency. He has contributed articles to trade publications, is the author of several books and has written for the *Volta Review*. Mr. Calkins is now 88 years old and is still following his "new" career of writing. An article written by him in tribute to his former teacher appeared in a recent issue of *This Week*.

The Ewings Speak in Washington

WHILE in Washington, D. C., in October, Dr. and Mrs. A. W. G. Ewing spoke on the "Oral Education of the Young Deaf Child" at a meeting sponsored by the Volta Bureau. The Ewings, of Manchester, England, are outstanding educators of the deaf and are well-known in the U. S. Their work and study, individually and as a team, have influenced the education of the deaf throughout the world.

Dr. A. W. G. Ewing, director of the Department of Education of the Deaf at the University of Manchester, spoke first on the university's teacher training program. Stressing the international aspects of their work, he explained that the instruction necessarily considers the varying cultural and religious outlooks of teachers in training who come from many countries and parts of the world. Included in the curriculum is a detailed child study course covering the first three years of the life of a normal child.

Dr. Ewing pointed out that the Education Act of 1944 provided that every child was entitled to an education and that parents should have the right to choose the school for their child. Since the act went into effect, the number of children in classes or schools for the deaf and hard of hearing in England has increased approximately 2000. This is not due to an increase in the incidence of deafness, but to an increased awareness of the value of special education. Another reason is the increased responsibility of medical and health officers in determining the child's need for special training.

Dr. Ewing then told about the various types of schools and classes in England, and explained that all education is oral.

The present program in England consists of two phases—primary and secondary prevention. Primary prevention is considered important since it has been found that in some instances, if the child had been referred to a clinic before the age of two, treatment could have been given and the degree of deafness lessened and in a few cases eliminated. The emphasis, then, is on the detection of deafness at the earliest possible age.

Dr. and Mrs. Ewing have developed a practical screening test now in use in England. By means of this test they have been successful in testing children as young as seven months of age. During their stay in Washington they demonstrated this test at Children's Hospital. In England over 600 health workers have been trained to give the screening test in homes. Mrs. Ewing has been responsible for most of this training.

Secondary prevention concerns the effects of deafness. Mrs. Ewing explained that the handicap of deafness is more than a lack of speech. It is a handicap to thinking and to attaining social maturity. For this reason it is important not to wait until a child is five or six years old before giving him the proper environment and help. If it is not provided while he is very young, and if nothing is done for him before he enters school at the age of three or four, he may grow up seeing-minded rather than hearing-minded. He will have developed a way of thinking without words.

Because of this belief, the main emphasis of secondary prevention is on parent guidance, and is particularly designed to help parents during the child's preschool years. At the present time Mrs. Ewing, who was formerly head of the Department of Education of the Deaf at Manchester University, is engaged in the training of personnel for the parent guidance program.

Parents are taught how to get their deaf child's attention, how to talk to him, how to give him the proper introduction to amplification, and how to deal with all other problems that may occur because of his deafness. The work with parents is individual, but group guidance is given once each week at the clinic in Manchester. On these occasions two sets of parents demonstrate how they communicate with their deaf children.

During their stay in the U. S. the Ewings visited a number of schools and research centers. They returned to England on November 1.

The Place of GSR Audiometry In Work With Young Children

**A Paper Delivered at the 1956 Summer Meeting
Alexander Graham Bell Association for the Deaf, Los Angeles, June, 1956**

JACK ROSEN

THE importance of early diagnosis of auditory disorders in young children no longer needs a defense. Our attention is more and more drawn to the medical, psychological, educational and social advantages of early assessment. Much has been done in recent years to develop a variety of techniques to accomplish this very difficult task, each technique contributing something further to the solution of the problem.

Our perspective has expanded to include children of ever younger ages, and to include children who suffer from auditory handicaps more complex than simple "deafness." Besides the infants who are simply too immature to participate in any of the well-known play devices, the greatest challenge arises in the differentiation of true peripheral deafness from such other handicaps as mental defect, brain injury, infantile autism, etc. These are children who may lack speech, may be unable to play normally and may be unable to relate normally to parents, teachers, clinicians or to the general environment, and are thereby excluded from reliable or valid application of any of the variations of play audiometry. Yet, diagnosis of any of these handicaps by the otologist, neurologist or psychiatrist may depend upon learning the extent to which true deafness contributes to the handicap. We need to seek ever new techniques and instruments to aid in the evaluation of children who cannot respond adequately to either standard or play audiometry. To overcome such diagnostic obstacles, many experimenters and clinicians have sought an objective measurement of hearing function.

Mr. Rosen is Supervisor of Clinical Audiology, Cleveland Hearing and Speech Center, and assistant clinical professor, Western Reserve University. He was formerly director of research, San Francisco Hearing and Speech Center. His paper was read on June 19 at the 1956 Summer Meeting of the Association.

Threshold of Hearing

If we could agree upon what we mean by the "threshold of hearing" in a normal person, an aphasic child, a mentally defective child and in an autistic or schizoid child, and if we could discover a physiological mechanism which would always produce a response to a sound which is above the unknown "threshold of hearing" of the ear being tested, and if we could then invent instrumentation to record this response, we would have objective audiometry. All that would be needed then would be to place a child in the "black box," press a button or turn a crank, and out would come a neat audiogram. The greatest single problem of audiometry would have been solved, and we audiologists could devote ourselves to other pursuits.

Unfortunately these three "ifs" still delay the advent of objective audiometry, whatever that may prove to be. We do, however, have a variety of techniques and instruments which can assist the experienced clinician to evaluate a patient's hearing. Standard audiometry is not objective, of course, but the information which it supplies has contributed untold benefits to the management of patients and pupils. When standard audiometry cannot be applied because of the patient's age, neurological condition or psychological condition, we utilize any or all techniques which will supply similar information. Techniques need not be evaluated upon the basis of their objectivity so much as upon their ability to provide information, and it is upon this basis that galvanic skin response audiometry (GSR) should be evaluated.

To understand the role and administration of GSR audiometry it will be helpful to consider its relationship to standard pure tone audiometry. In subjective pure tone audiometry, we measure or record only one thing directly, the observable response to a controlled stimulus. Having recorded a series of responses to a series of stimuli, and having accepted a number of assumptions and drawn a number of inferences, we conclude that the patient's sensory function is intact to a certain degree.

The Hearing Test Is a Series of Tests

A hearing test can thus be considered a series of tests, each of which tests the hypothesis that the patient can hear a particular tone at a certain level of intensity. If the patient does not respond, the hypothesis is not supported but neither can it be rejected. We observe only that the patient demonstrates responses at a certain level of intensity and does not do so below that intensity. We can assume that he hears all intensities higher than the lowest level at which he responded consistently. Below that level we do not know, except by inference, whether he hears or not, since we do not measure the degree of deafness but only the degree of hearing, and that only indirectly.

Since each test in this series is, in a sense, separate, there is no reason to require the same response at each step. If a child blinks, smiles or cries to a tone of 60 decibels but does not drop a marble in a box to a tone of the same frequency at 80 or 90 db, which is the more valid indicator of his auditory sensitivity? The GSR test differs from other audiometric tests mainly in the fact that it makes available an additional response, and does so by an additional form of conditioning.

The Galvanic Skin Response

The galvanic skin response is, as the name implies, an electrical characteristic of the skin. If we pass a very slight electrical current through the skin of the palm, fingers or sole of the foot, the current meets with resistance which can be measured by electrical instruments. Changes of this resistance are occurring during most of our waking hours, the most rapid of these changes constituting the galvanic skin responses.

The skin responses are produced by the sweat glands, which are activated by the sympathetic division of the autonomic nervous system. While the hypothalamus, in the mid-brain, is important in the activation of sympathetic functions, the contribution of other parts of the brain is not clear. Almost any gross adjustment of the organism, whether by a major muscle activity, a shift of attention, startle or fear, can cause a skin response. Thus, the role of the cortex, and "consciousness," is not to be neglected in considering the clinical application of the GSR. When the patient hears a sound there may be a skin response, but exactly the same response may be elicited by the sight of a new toy, by frustration, fear or even by the act of deciding to play with one of the toys. The nonspecific nature of the skin response complicates the test.

Complications of The GSR Test

The test is further complicated by other characteristics of the skin response, such as its relative slowness. The normal adult taking an audiometric test can usually raise his finger or press a button within a small fraction of a second after the onset of the tone. Because the autonomic nervous system responds only indirectly to external stimuli, the skin response is delayed for one-half to several seconds after the tone is on. In some cases, particularly in certain kinds of brain injury, the so-called latency may extend to many seconds, and in all individuals the latency varies from time to time. Many events may occur between the onset of the tone and the beginning of the response, and it may be extremely difficult to decide whether the response is to the tone or to another event.

One of the greatest difficulties in utilizing the skin responses is the fact that the responses are diminished and may even disappear upon repetition of the stimuli. Negative adaptation was one of the early obstacles to the application of the GSR to audiometry. Only the adaptation of Pavlov's familiar conditioning procedure made possible any significant success. Pavlov

rang a bell and then dropped meat powder in the dog's tray. After several sequences the dog began to salivate in response to the bell before the food appeared. In GSR audiometry, a tone is presented and followed by a mild electric shock. The shock almost invariably elicits a skin response. After this sequence occurs a number of times there is usually an anticipatory response to the tone itself.

Conditioning Procedure

By classical conditioning procedure and standard audiometric practice, the "routine" test of hearing by GSR audiometry would begin with a tone, preferably 1000 cycles per second, at a high intensity level. This would be followed a second or two later by a shock. The sequence is repeated several times. When responses to the tone occur consistently before the shock is administered, the shock is omitted, and the intensity of the tones is decreased until a level is reached at which there is no response. The intensity is raised until a response is elicited, lowered and raised until the minimum level which elicits consistent responses is determined. This is considered to be the threshold for that frequency. A tone of a different frequency is presented, the conditioning repeated and threshold established for that tone. The procedure is repeated for each frequency to be tested, and in each ear.

In practice, there is a great deal of variation from this procedure. The most important variable, of course, is the child himself. Since the hearing test results depend upon one's skill in taking into account a host of unknown variables rather than upon examination of an isolated organ or simple reflex, testing cannot be made routine. The "typical" clinical procedure is anything but typical in many cases.

The Test Situation

The test situation must be such as to minimize the fears of the child, avoid excessive distractions which would increase the difficulty of interpretation of the skin responses and to lead, whenever possible, to verification of the skin responses by some kind of gross, observable response of the child. The entire procedure is facilitated by utilization of a team of two clinicians. One does the actual testing from a separate room, in which is located all the equipment except loudspeaker, earphones and electrodes. The other serves as test assistant to engage the child in play which will distract him from the various wires attached to him and to direct him, if possible, toward cooperation in some form of play audiometry.

A pair of electrodes is attached to the sole and dorsal surface of one foot or to two fingers of one hand. These are the pickup electrodes which feed a small current through the skin, and by means of which the changes in skin resistance are conveyed to the equipment in the control room. Another pair of electrodes is attached to the calf muscles of the opposite leg. These electrodes transmit a brief electrical shock to the calf in order to condition the response to tones. The binaural headset of a standard clinical audiometer is placed upon the ears. Gaining the child's acceptance of these many attachments presents difficulties, but those who have had experience in solving the earphone problem will be interested to learn that electrodes on the foot and leg seem much less threatening to a child than do the phones. Sometimes it is possible to attach the electrodes, but necessary to do all testing through the loudspeaker alone.

Test Follows an Estimate of the Maximum Hearing Loss

Testing begins after a gross estimate of the maximum hearing loss has been established by noisemakers, calibrated sound effects, music, speech, play audiometry, etc. Beginning at this estimated level, and at a frequency most likely to elicit a response or most pertinent to the purposes of the test, a pure tone is presented through one of the earphones. If a response does not occur, the intensity is increased until a skin response appears. This is recorded by the movement of the pen of the recording galvanometer. Conditioning to this tone is established by using the minimum shock voltage which elicits consistent responses. At this point the departure from laboratory procedures and from routine audiometric practices is most evident. During the course

of testing, the acoustic stimuli may be varied as the clinician sees fit. A period of presentation of pure tones may suddenly be interrupted by the introduction of speech, music, etc. The pure tones are altered in frequency at the discretion of the tester without waiting for the achievement of absolute threshold for the original tone. The tone-shock sequences are not presented in a pre-arranged order. A tone may be presented in a long pulse, a short one or in a rapid series of pulses. The utmost flexibility is adopted to delay or overcome the negative adaptation which might otherwise terminate the test.

Similarly, interpretation of responses does not depend upon criteria required by the laboratory experimenter but upon the characteristics of the responses of the particular patient. Some respond very markedly to the tones, other respond minimally and some do not seem to respond at all. In some cases the chart is very active, the pen tracing rapid fluctuations of skin resistance even in the complete absence of tones or shocks. Others present charts which are quite stable, in which responses to tones, shocks and to other events are clearly delineated. In still others it sometimes seems that responses are occurring to all kinds of internal stimuli, but to external stimuli, such as tones or shocks, there may be no discernible deflection of the pen.

To interpret the chart produced by the galvanometer requires the most careful evaluation of all that occurs in the test situation. The child's cough or sneeze will usually produce strong responses, stronger than those elicited by the acoustic stimuli. If the child is crying, the cries themselves may or may not produce responses, but the rapid, jerky breathing accompanying the crying may cause activities of the pen which will prove most frustrating to the tester. An active game in the test room may interfere with the testing. Even in fitting together the parts of a puzzle or in coloring, the skin responses of some children are active enough to make one wish for the "black box" which would do the job effortlessly. On the other hand, children may be so inactive or so out of contact with the situation that one must interpret the slightest waver of the pen as a response, and it may even be necessary to deliberately stir the child up in order to stimulate the function of the sweat glands.

With such difficulties to be overcome in the interpretation of the responses, it is extremely important to verify one's interpretations as far as possible. Consistency of the responses is one form of verification, and consistency of the results with the child's earlier responses to gross tests is another. In addition, clues are frequently offered by the skin responses which may lead to recognition of other activities of the child as responses to sounds, activities which might otherwise go unrecognized as related to the sounds. Furthermore, the conditioning utilized introduces an element of surprise and anticipation which may not exist in other methods of testing. In most testing procedures one struggles to maintain the child's attention to the sounds. During GSR testing, however, the child may be happily engaged in an activity which is completely unrelated to the test procedure when the sudden intrusion of a tone often evokes a twitch of the leg in anticipation of the shock, an eye movement or a slight, almost involuntary cry or smile.

Most important is the use of this type of conditioning and the information derived from the skin responses to make some form of play audiometry possible. Children whose responses to play audiometry have been too erratic to be accepted as valid will frequently respond more consistently or for longer periods during or after GSR audiometry. In every case in which there is a remote possibility that the child can be induced to take part in a voluntary activity to indicate that he hears a tone, considerable effort should be expended to attain this.

An interesting variation of the conditioning procedure will prove effective with some cases, particularly older children and adults who are malingering—pretending deafness for one reason or another. This is called "instrumental conditioning." When the skin responses indicate that a tone is heard, and the patient does not produce the voluntary action which is demanded of him, the conditioning shock is administered. When he does respond voluntarily the shock is omitted. If the shock is felt to be unpleasant, although not necessarily painful, a few such condition-

ing sequences will often produce greatly improved voluntary responses. In effect, instrumental conditioning might be interpreted, in this application, as punishment for failure to respond.

All these variations, and others too numerous and involved to be described here, augment the information which will be derived from the tests. Our goal in the hearing test is the accumulation of information about the hearing status of the patient, not the rote memorization of a procedure to be carried out mechanically. If skin responses indicate hearing at levels lower than indicated by other responses, the skin responses have contributed valuable information. If, on the other hand, the child points to his ear in response to a tone but fails to produce a recognizable skin response, the pointing to the ear is more important than the absence of the skin response. Until the "black box" is possible each audiometric technique has limitations but, fortunately, the limitations of one do not necessarily coincide with those of another.

The limitations of GSR audiometry are many. There are children who do not provide adequate skin responses. There are cases in which threshold measurements possible by other means cannot be duplicated by means of GSR. Some authorities even conjecture about the possibility that skin responses may occur in response to subcortical stimulation. They believe that the lower portions of the brain may be responding to sounds and causing skin responses even though the stimulation is insufficient to arouse awareness of the presence of sound. Clinically, this has not been evident. The limitations are severe enough without this problem.

One cannot envision GSR audiometry as the method of choice for routine testing. GSR audiometry is extremely time-consuming, costly, and necessary only in cases where other methods fail. Its administration requires thorough familiarity with all the testing methods available for young children, as well as special study of the characteristics of the GSR. Successful testing is not done by occasional observation or experiments, but by day-to-day experience with a wide variety of cases. Certainly the GSR test of hearing does not belong in the public school screening program, nor should it be administered by the nurse or secretary in the physician's office. Its place at this time is in the hearing clinic which handles a heavy caseload of preschool children requiring special diagnostic procedures.

Administered by an experienced clinical team, GSR testing makes possible a reliable measurement or a reasonable estimate of hearing in numerous children not otherwise testable. It thereby supplies diagnostic information to the otologist to indicate whether surgery is necessary or feasible, and suggests the educational or therapeutic direction most suitable to the child's needs. By the use of GSR, many children can be embarked earlier in modern preschool education for the deaf, and others detoured from classes for the deaf to more appropriate regimes. As a result of the evaluation made possible by GSR, children can be fitted earlier with hearing aids, and fitted with the kinds of amplification best suited to their needs.

It must be emphasized and re-emphasized that the elaborate instrumentation of GSR audiometry and of other audiometric methods does not evaluate hearing. It is the examiner or clinician who evaluates hearing. His success will depend upon the extent to which rigidity of approach to the test situation is discarded in favor of maximum flexibility in evaluating the total child and his response to his environment.

PERFECT MEMBERSHIP RECORD

The Lexington School for the Deaf, New York City, is the first school this year to report 100 per cent faculty membership in the Alexander Graham Bell Association for the Deaf. Although records are not complete for earlier years, they show that this is the fifth year in succession that we have had the pleasure of welcoming all the members of the Lexington school faculty as Association members. Mrs. Mary P. Covell is the Association's faculty representative at the school.

Hearing Aid Garments

DOROTHY M. MCEVOY

"THEY don't look suitable for a child to wear outside her clothing," remarked Judy's mother when looking at hearing aid garments fashioned by commercial designers. How right she was! The strap-pocket arrangements, which are functional for adults, were not designed specifically for children and do not meet the needs of young hearing aid wearers.

This year, two seniors who majored in the area of deaf and hard of hearing at Illinois State Normal University undertook to design and make garments for younger children. The results were varying in degrees of success, but served as a basis for mothers making garments for their children who attend our laboratory school.

The students set up some requirements such as attractiveness and function necessary for a successful garment. A garment to be functional should provide easy access to the volume control and should permit the cord to be wholly or partially covered. Each garment must be designed for a specific hearing aid, and measurements must be accurate.

To reduce the hazard of dropping the aid or damaging the cord, it should be possible to remove the garment with the aid in the pocket. The students also decided that a child should be able to adjust the garment. There should be no surface rubbing on the microphone.

The garments worn by the children in the accompanying photograph are the results of this experiment. From left to right, back row, they are:

Kathy. This bib-type garment is made of rose sateen with white rick-rack trim. It is buttoned at the shoulders to buttons sewed on the shoulder seams of her dress. Ties at the waistline make a bow in back. The front of the waist consisted of two thicknesses of the material, and the pocket for the hearing aid was made by stitching the two thicknesses together.

Terry wears an unusually large aid that requires a long pocket. His grandmother made a buttonhole at the top of the pocket through which the cord is threaded so as to keep it under his shirt. In the event of feedback, the pocket should be placed on the opposite side of the shirt.

Suzy wears another bib-type garment. It is of corduroy and differs from Kathy's in that it snaps at the shoulders with grip-type fasteners. This garment is fastened at the waist to buttons sewn on the dress belt.

In the front row:

Mitchell wears a brown corduroy jacket that suits his cowboy outfit. It is buttoned in front and may be worn either open or closed. The pocket of this garment might also have to be moved to the right side to prevent feedback.

Kathleen is wearing a pinafore with the pocket on the inside of the bib. This garment buttons at the shoulder and has a sash which ties in the back. The material is a cotton print.

Janet has a bolero jacket—a dressy garment of thin cotton material. It does not

(*Continued on page 412*)

Miss McEvoy is supervising teacher of the Deaf and Hard of Hearing Special Education Laboratory School at Illinois State University, Normal, Ill.

Some Results of the John Tracy Correspondence Course

An Address Delivered at the 1956 Summer Meeting Alexander Graham Bell Association for the Deaf

HARRIET MONTAGUE

STATEMENTS concerning the John Tracy Correspondence Course range from the general to the concrete, from the individual to the mass numbers of people and localities involved. I often start my talks to visitors at the clinic with the remark that the correspondence course is the wholesale department of the clinic. At the present moment there are 1,118 families actively enrolled in all the 48 states, Alaska, Hawaii, the Philippines, all the provinces of Canada except the Northwest Territory, and 15 foreign countries. We send the lessons out only in English and Spanish, but they have been translated into many other languages. In all the Scandinavian countries they have been translated and mimeographed and are being distributed by groups of parents of deaf children or organizations of hard of hearing adults. In Yugoslavia they have been translated into Serbian and Croatian and have been printed by an association of the deaf and distributed in booklet form. Incidentally, the translation was made by a young man who lost all his hearing at the age of 12 and has educated himself since then, including teaching himself English and several other languages.

Altogether, we have sent the lessons to 7,539 families in 54 different countries, including such far off places as Eritrea, Ethiopia, the Fiji Islands, North Africa, South Africa, Korea, Okinawa, Indonesia, Malaya, Madagascar, Turkey, Iran, India, Pakistan, China and Japan.

So much for the wholesale part of it, and the long distance reaches. The individual results are what really count. Every letter written by a parent receives a personal reply. The whole approach is individual. It is true, the problem is the same the world over, and one learns a little about dealing with different problems simply from confronting the same ones over and over again. We know that untrained preschool deaf children often have temper tantrums from sheer frustration, that they wet the bed, suck their thumbs, refuse to chew their food, and often run around the house in the night. The questions I am asked most often have to do with bed wetting, tantrums, discipline, sleeping habits, even more than they have to do with lipreading, language and speech. And I have learned that very often, after a mother works with our lessons for two or three months and finds that she can actually get results, she begins to calm down. The child also begins to calm down; the temper tantrums are farther apart; all of a sudden the bed wetting miraculously stops; the thumb sucking is forgotten; and the child begins to sleep better at night. It appears to be a question of providing the restless, energetic child with enjoyable activity and opportunity for success—of praising him for his success and so building up his independence and his self-esteem . I do not say that these results are universal, but they come about so often that we have learned to expect them.

For those who are not familiar with the Tracy Correspondence Course, it covers a year's work with a preschool deaf child, described in simple language that any untrained mother can understand and follow. It is mailed in 12 installments and includes the first lessons in lipreading, language, sense training, acoustic training and speech preparation, with many suggestions in regard to the behavior problems mentioned

Mrs. Montague is director of the correspondence course offered by the John Tracy Clinic, Los Angeles and an Advisory Director of the Alexander Graham Bell Association for the Deaf. She also conducts a regular column for parents in the *Volta Review*. Mrs. Montague, who is totally deaf, presented her Summer Meeting paper on June 22, 1956.

above. It offers descriptions of methods of talking to lipreaders, with suggestions for games involving lipreading. In fact, everything in the course is offered as a game and not as a drill, and children, as a rule, enjoy the the lessons and even ask for them. It is not at all uncommon for a mother to write us that she has to stop in the midst of her housework and sit down to have a lesson with her deaf child. Parents are often startled at the eagerness with which the children come to the little table to match pictures or work puzzles or go fishing or play store.

The parents are asked to send regular reports on the results they obtain, and every report receives a personal reply. The best way to find out what the correspondence course means to some of the parents is to read their letters. We receive all the way from 20 to 50 letters and reports every day, and there are probably from forty to fifty thousand in our files. Yet almost all of them are interesting and all of them are individual. A mother in British Columbia writes: "I am especially pleased with the way Bruce's temper tantrums have decreased. I was quite worried about them."

A mother in Roanoke, Virginia, who has had two installments of the course, writes:

"I cannot begin to tell you how much your course has already done for our entire family. It has given me direction and a goal toward which to work. I am frank to admit that I was reaching the point of complete frustration because I simply did not know how to approach Gary. I have read and re-read every page of information you have sent so far, and it has been of tremendous value."

Just a few days ago the following letter was received from a father in Guatemala, who has just begun using the Spanish edition of the lessons. He writes in Spanish:

"On reading you last attentive letter of May 31, I find my gratitude even deeper. I waited a few days before answering, because of my wish to send you some information on the results obtained with Miguel in regard to the first two lessons of your course . . .

"I am happy to inform you that Miguel has begun to assimilate with absolute ease the first part of the course, just as you said, because of his three and a half years. But although in reality these lessons have been easy to do because of his age, they have been of great profit and interest to me, seeing that they have taught me the methodical, practical and simple way to teach, correct and begin to educate my child. . . . The lessons that we have put into practice with Miguel have been to his real entertainment, a game that he anxiously asks for, and which he enjoys above measure without sensing the time."

A mother in New Zealand who has just completed the lessons, writes:

"Your course has given us much vital information and encouragement which we could not have got elsewhere. Like 99 per cent of people, we knew nothing about the deaf and their problems, and when we first realized that our own infant daughter had defective hearing, we were desperate and helpless. . . . Finally, we met the mother of a deaf boy who told us about your course. You were prompt in replying to our letter of inquiry, and at last we were getting answers to our questions. The result of all this is that our girl, now turned three, has made excellent progress, and we have every confidence in the future. . . . Working with her has given us patience and understanding. We have gathered together much literature on the problems of the deaf, and we are gradually educating our friends to realize that the deaf are not backward mentally, and that they can take their place in life with hearing people.

"Rachel realizes that there is such a thing as language. She understands many words through lipreading, and since she now has a desk hearing aid she has begun to repeat words though auditory stimulus. Behavior problems are gradually disappearing, and tantrums are rare. She is very self-reliant, and can now dress herself and attend to her own toilet needs. All of this really began with your lessons."

Parents Are Realistic

I could go on quoting thousands of such letters. Perhaps some of the parents, in their gratitude, are too optimistic, but there is definitely a practical side to what they say, and they cannot greatly overestimate the change in the child and the change in their own attitudes that have come about through this practical effort to help the child.

There is another far reaching result coming about through the Tracy Correspondence Course. This is a steady growth in the determination among parents to organize and secure better advantages for their children. They have spent a year or two years teaching their children to understand language through lipreading. They have found that it is possible to communicate with severely deaf children by means of speech. They look around. They find other parents who are using these same lessons and who are also interested in securing good speech for the deaf child. They begin to organize, and organization brings results.

Alexander Graham Bell believed very strongly in parent organizations and sponsored several of them. He even helped write the constitution and by-laws of the

first organization of parents of deaf children started in Chicago. I often wish I could tell Dr. and Mrs. Bell about my present job.

In the little school Dr. Bell opened in Washington in 1883, he enrolled children of four and five, at a time when the age of admission in most schools for the deaf was eight and even ten years. He held classes for parents several times a week, and he was endlessly patient about answering letters that came to him from parents. I think he would be pleased to know about our correspondence course.

A number of active organizations of parents have come about because of the correspondence course. In Miami, Florida, a foster mother who is caring for a little deaf boy, a ward of the state, enrolled for our lesssons in 1952 when the boy was two years old. Mothers of other deaf children began going to her for help and advice, and they formed a study club to work together to teach their children. They had a good deal of publicity and in 1953 the foster mother was named Mother of the Year in Miami. A good many people who had not before heard of the problems of deafness became interested. Now all the original group of deaf children are in a public nursery school in Miami, and Mrs. Payne, the foster mother, is continuing her efforts to help deaf children and their parents.

The Tracy Course in Norway

In Oslo, Norway, up to 1948 the age of admission for children in schools for the deaf was seven years. About that time an eminent otologist, Dr. Truls Leegard, came to America, heard about the Tracy Correspondence Course, and wrote to find out about it. When he returned to Norway he began advising the parents of deaf children who consulted him to enroll for these lessons. Several parents who could read and write English enrolled for the course. The mothers formed a group and very shortly they organized the first nursery school for the deaf in Oslo. They had the lessons translated into Norwegian and distributed them among mothers who could not read English. Through their influence three young women have come from Oslo to receive training to teach the deaf. One went to Central Institute, one to Clarke School and one came to the Tracy Clinic. All three attended summer school at the Tracy Clinic and one taught there a year before returning to Oslo. Now there is a flourishing nursery school for the deaf in Oslo.

Australian Parents Organize

A group of parents in Brisbane, Australia, who had used the Tracy Correspondend Course, organized. They called their organization "The Association for the Improved Education for Deaf Children," and issued an appeal to the public which they called "The Oral Deaf School Appeal." The aims and objectives of this association bear considerable resemblance to the tentative objectives of a proposed national association of parents in the United States: (1) Establish in Brisbane an Oral Deaf School; (2) Influence the Queensland Government in using the most modern methods for training children with defective hearing; (3) Encourage research into the abilities and educational needs of children with defective hearing; (4) Use in Queensland the most suitable results of such research; (5) Raise funds for carrying out these objectives and (6) Endeavor to bring about legislation to have defective hearing in minors declared a notifiable disability.

This organization was started in 1954. Now, in 1956, there is a well-established school for the deaf, and just the other day I received a letter from the headmaster describing it. They have their own building with twenty children and a staff of five trained teachers. It is entirely an oral school. It came into being as a direct result of the Tracy Correspondence Course.

In Austin, Texas, a group of correspondence course parents started a Speech and Hearing Center, which provides a nursery school for young deaf children. When Mrs. Tracy spoke in Austin recently, she met many of these mothers and learned that the center came about through the parents' initial work with their children at home. A recent letter from one of the mothers is very revealing:

"We are reconciled to the fact that Ann has a severe hearing loss. There apparently isn't anything the medical profession can do to alleviate

(*Continued on page 412*)

The Christmas Story

Adapted to the Young Deaf Child's Vocabulary

SISTER MARY HENRIELLA, OSF

Appropriate records as indicated in each scene add background music. Narration for each scene can be printed on a large sheet of paper hung on a chart holder at the side of the stage. A spotlight focused on the chart will enable the audience to read as well as hear what the children are speaking. Cast of characters: Infant Jesus; Mary; Joseph; Annunciation Angel; Angel Announcing to Shepherds; Crib Angels; Shepherds; Kings; Camels; Donkey; Ox and Inn Keepers. Curtain Angels stand in front of the curtain. After speaking each time, they draw the curtain and stand at the side of the stage.

SCENE I

CURTAIN ANGEL No. 1: Scene one.

CURTAIN ANGEL No. 2: The Angel comes to Mary.

(Record: "Ave Maria")

(*As curtain is opened, Mary is kneeling in prayer.*)

(Enter the Annunciation Angel)

ANNUNCIATION ANGEL: Hail Mary, full of grace, the Lord is with thee! I come from God. Will you be the Mother of God?

MARY: Yes, I will be the Mother of God.

SCENE II

CURTAIN ANGEL No. 1: Scene two.

CURTAIN ANGEL No. 2: Mary and Joseph must go away.

(Record: "O Come, O Come Emmanuel")

(*Mary is sewing. Joseph enters*)

JOSEPH: Mary, I'm sorry, but we must go away.

MARY: That's alright, Joseph, we will go.

(*Mary and Joseph begin to pack clothing and food for the journey.*)

SCENE III

CURTAIN ANGEL No. 1: Scene three.

CURTAIN ANGEL No. 2: Mary and Joseph walked and walked.

(Record: "O Little Town of Bethlehem")

(*Mary is seated on a donkey (sturdy boy on all fours). Joseph walks along side them with a walking stick and the clothes. Three innkeepers are seated at different points on the stage holding "half doors" (made from large cardboard boxes). Joseph, Mary and the donkey walk around the stage.*)

JOSEPH: It is very cold.

MARY: I don't mind.

(*Joseph knocks at the door of Innkeeper No. 1*)

JOSEPH: May we sleep here?

INNKEEPER No. 1: No, no. Go away.

(*Joseph shakes his head sadly at Mary. He knocks at the door of Innkeeper No. 2*)

JOSEPH: May we sleep here?

INNKEEPER No. 2: No, no. Go away.

(*Joseph knocks at the door of Innkeeper No. 3*)

JOSEPH: May we sleep here?

INNKEEPER No. 3: Yes, you may sleep in the stable. Come.

(*The Innkeeper leads Mary, Joseph and the donkey to the stable.*)

SCENE IV

CURTAIN ANGEL No. 1: Scene four.

CURTAIN ANGEL No. 2: The Angel comes to the Shepherds.

(Record: "Joy to the World.")

(*Shepherds are watching their sheep by the fireside*)

(*Angel enters*)

ANGEL: Fear not, I bring you good tidings of great joy. Jesus has come.

(*Shepherds arising are astonished*)

SHEPHERD 1: Come, we must go adore Him.

SHEPHERD 2: Come, let's go.

SHEPHERD 3: I will bring a lamb.

SCENE V

CURTAIN ANGEL No. 1: Scene five.

CURTAIN ANGEL No. 2: The Kings come.

(Record: "We Three Kings of Orient Are.")

KING 1: See that star!

KING 2: Yes, I do.

(*Continued on page 412*)

Sister Mary Henriella teaches in the primary department of St. John's School for the Deaf, Milwaukee, Wis.

Potentialities of Auditory Perception For Various Levels of Hearing Loss

A Paper Delivered at the 1956 Summer Meeting
Alexander Graham Bell Association for the Deaf, Los Angeles, June, 1956

PAUL J. LA BENZ, SC.D.

PERCEPTION of speech or any other auditory stimulus depends largely on the frequency-intensity characteristics of the stimulus itself and of the perceiving mechanism. Perception can be regarded as the appreciation of a stimulus either in terms of awareness, especially in the case of pure tones, or of identification or interpretation as with speech. When applied to speech, perception is sometimes referred to as discrimination or articulation. The most familiar example of pure tone perception is the audiogram. That the audiogram bears more than a casual relationship to the ability to perceive speech is generally well known. For example, the average pure tone loss in the frequency range 500-2000 cps is found to agree closely with the decibel loss for hearing speech as tested with spondaic words. The configuration of the audiogram likewise has implications concerning the ability to understand other types of speech. A precise statement of the over-all potential for auditory perception under all conditions of hearing impairment is not yet possible. Nevertheless, certain facts and observations are available which bear consideration and suggest lines along which estimates can be made as to the potentialities for auditory perception.

It is obvious that in order to be perceived or understood a sound must be sufficiently loud or, more precisely, intense. The question at hand is how loud? Starting at some point where the listener first is able to identify the most powerful sound [ɔ] in an average sample of speech, we find that intensity must be increased about 30 db before the faintest speech sound [θ] becomes audible 50 per cent of the times presented. The percentage of items or times an item is intelligible as intensity changes in known, of course, as the articulation function or simply as articulation. Articulation functions can be plotted for single sounds[1], the phonemes, as well as for more complex units of speech[1,2,3]. As intensity is increased above threshold more and more sounds become intelligible, until at a level about 30 db higher, all sounds can be identified at least 50 per cent of the time.

The average conversational level of speech is approximately 60 db above normal threshold of hearing at a distance of some three feet from the speaker. At the speaker's lips the level is about 90 db. The more powerful phonemes may exceed the average level of speech by some 20 db or more. Stressing and accenting may cause variations in the level of speech as much as 50 or 60 db, but generally the range of levels used rarely exceeds 35 db. In the absence of interfering noise, the intensity of average speech is more than adequate for intelligible verbal communication with normal hearing.

A hearing loss of 25 or 30 db for most frequencies may occur before a person begins to notice difficulty in understanding speech, provided the onset of loss has been gradual. Usually this is noticed first in situations involving distant communication such as lectures. If we were to test such a person with samples of speech at average levels, we would find that he hears only about 75 per cent of a list of phonetically balanced (PB) words.[4] If he is per-

Dr. La Benz is acoustic supervisor, The Bill Wilkerson Hearing and Speech Center, Nashville, Tenn. His paper was read on June 19, 1956.

[1] Fletcher, H., *Speech and Hearing in Communication*. N. Y., Van Nostrand, 1953.

[2] Egan, J. P., "Articulation Testing Methods." *OSRD Report No. 3802*, Psycho-Acoustic Laboratory, Harvard University, Nov. 1, 1944. (Available from Office of Technical Services, Department of Commerce, Washington 25, D. C.)

[3] Hudgins, C. V., Hawkins, J. E. and Stevens, S. S., "The Development of Recorded Auditory Tests for Measuring Hearing Loss for Speech." *Laryngoscope* 57:57-89, 1947.

[4] Davis, H., "The Articulation Area and the Social Adequacy Index for Hearing." *Laryngoscope* 58:761-778, 1948.

mitted to watch the speaker's face his score might rise to about 88 per cent.[5] A score of 75 per cent for PB words is equivalent to almost 95 per cent for sentences[2]. If this person's hearing loss maintained its configuration but increased by another 10 db, his PB score would fall to 40 per cent without the help of visual clues (70% with) and to 68 per cent for sentences. Another 10 db increase in the same loss, a loss of 50 db for spondees, would decrease the intelligibility of PB lists to less than 10 per cent by ear alone, although he might score almost 50 per cent with the aid of visual clues. If his loss increases further to 60 db he would still be able to identify some sounds, and with lipreading make out as many as 20 or 30 per cent of the words, depending on his proficiency. For losses as great or greater than this, in order to continue testing, it would be necessary to decrease distance, raise the voice level or resort to sound amplifying devices. Hearing problems involving only flat sensitivity losses would present little difficulty in the present day, because hearing aids are more than capable of amplifying speech to the threshold of discomfort. This threshold is conceded to be about 110 db above the normal threshold for pure tones in the speech range, and limits the expectation for auditory perception above losses of 75-80 db. This is so because the threshold of discomfort is reached for the powerful phonemes before the fainter ones are audible. Furthermore, it is rare to find flat losses of magnitudes greater than 60-65 db. The factors of recruitment and noise which may be present tend to complicate estimations of performance. However, from a theoretical point of view, uncomplicated flat losses above 75 db with maximal amplification could be expected to achieve PB scores inversely proportional to further increases in amount of loss, with a declining curve much like the mirror image of the familiar PB articulation function whose zero point would coincide with the threshold of discomfort. Data on this point, however, is lacking.

The effect of degree of hearing loss on speech perception cannot be considered without regard to frequency differences. Nor can the intensity of speech stimuli be considered altogether apart from the factors of frequency, since the two are closely interrelated as regards perception. Speech is not a steady-state phenomenon. Its components vary enormously in frequency and intensity and from instant to instant. Yet there is some degree of stability in its features, otherwise verbal communication would become a hopeless enterprise. Some phonemes, notably the vowels, are characterized by concentrations of energy in certain frequency regions which tend to make them distinctive[6]. These are the so-called formants, which are *regions* of energy density rather than geometric points along the frequency scale. These regions overlap somewhat from sound to sound and from speaker to speaker, yet the distinctive features of phonemes make for adequate discrimination under wide variations of listening conditions. In general, the problem of perception hinges largely upon formant structures of the phonemes and depends upon which of these can be heard. However, some phonemes, such as fricatives, do not seem to lend themselves to such orderly arrangements. Still no one can deny that these sounds also are discriminable. Furthermore, formant structure is altered under the impact of contiguous sounds[7,8,9] and perception is influenced by duration and inflection[9]. Taken by and large, the ability to perceive phonemes is reduced in fairly orderly fashion as more and more of the frequency spectrum, hence formant structure, is excluded by electrical filtering. Hearing impairment which changes with frequency can be considered to exert a filtering action on the speech spectrum. Phonemes vary in their resistance to distortion of this type[1]. Although the frequency range of speech extends from about 100 to 8000 cps, reasonably good perception is possible when frequencies above 3000 cps are rejected,

[5] Sumby, W. H. and Pollack, I., "Visual Contribution to Speech Intelligibility in Noise." *Journal of the Acoustical Society of America* 26:212-215, 1954.

[6] Potter, R. K., Kopp, G. A. and Green, H. C., *Visible Speech*, N. Y., Van Nostrand, 1947.

[7] Cooper, F. S. and others, "Some Experiments on the Perception of Synthetic Speech Sounds." *Journal of the Acoustical Society of America* 24:597-606, 1952.

[8] House, A. S. and Fairbanks, G., "The Influence of Consonant Environment Upon the Secondary Acoustical Characteristics of Vowels." *Journal of the Acoustical Society of America* 25:105-113, 1953.

[9] Tiffany, W. R., "Vowel Recognition as a Function of Duration, Frequency, Modulation and Phonetic Context." *Journal of Speech and Hearing Disorders* 18:289-301, 1953.

although some of the fricatives are seriously affected.

In Figure 1 some effects on phoneme intelligibility of restricting the frequency spectrum by low-pass filtering are shown.

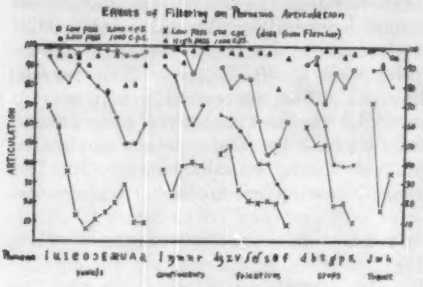


FIGURE 1

The effects of filtering on phoneme articulation (data from Fletcher)

All speech sounds become less intelligible as less of the sound spectrum is heard, but not all to the same extent. It can be seen that vowel intelligibility is relatively good when only frequencies lower than 2000 cps are heard, whereas the intelligibility of fricatives is markedly reduced. The relationship holds also for the 1000 cps cut-off. As the spectrum is reduced to frequencies below 500 cps even vowel intelligibility is very poor and, surprisingly, the intelligibility of some fricatives, continuants and stops becomes superior to that for some vowels. In contrast, note that when frequencies below 1000 cps are rejected and those above are heard (high-pass 1000 cps) intelligibility is relatively unaffected for most sounds, although most of the speech power is lost. What is not shown in the figure is the deleterious effect of filtering on phoneme quality. Quality can deteriorate appreciably before effects on intelligibility are noted. The type of data shown may have implications for an approach to auditory training of the young deaf child. A similar approach has been mentioned by Wedenberg[10] in terms of audibility of formants. It is interesting that, at least by inspection, the order of average intelligibility of these phonemes seems to bear no close relationship to the scale of difficulty developed by Hudgins and Numbers[11]. This is very likely because the factor of relative visibility is not taken into account.

In ordinary circumstances one is rarely required to discriminate isolated phonemes. The more usual unit is the word or some combination of words. Even the simplest unit is a combination of a number of phonemes. It is apparent from Figure 1 that under some particular condition of frequency distortion words composed mainly of one type of sound would be relatively unintelligible compared with words of another type. Tests of perception conducted with such samples tell virtually nothing about perception of ordinary speech. It is more to the point to inquire into perception of samples of words containing phonemes in proportion to the extent that these are found in ordinary speech. The PB word lists[2] are useful for this purpose. Also, the relationships of PB intelligibility to other types of speech are fairly well known.

To illustrate the effects of frequency distortion on the ability to discriminate PB words, groups of listeners were subjected to filtered samples of such recorded speech[12]. Each list of PB words was presented at 30 db above the listener's threshold for unfiltered spondees. The filters suppressed the spectrum at the rate of 30 db per octave beyond the nominal cut-off points. Power losses caused by this suppression were adjusted for each word to cause peaking on a VU meter across the output to phones. This procedure did not completely eliminate intensity differences because of audiogram variations, but tended to minimize such differences. The listeners consisted of 100 adults of whom 22 had normal hearing, 30 had conductive type hearing losses, 26 had mixed types and 22 perceptive type losses. The median audiograms for these groups are shown in Figure 2. The median and mean audiogram values were within 3 db for all frequencies below 4000 cps, and never exceeded 5 db up to 8000 cps. Three of the groups had reasonably flat losses up to 3000 cps at least; the perceptive losses increased steadily with frequency. The mean

[10] Wedenberg, E., "Auditory Training of Severely Hard of Hearing Pre-School Children." *Acta Oto-Laryngologica, Supplem.* 110:1-82, 1954.

[11] Hudgins, C. V. and Numbers, F. C., "An Investigation of the Intelligibility of the Speech of the Deaf." *Genetic Psychology Monographs* 25:289-392, 1942.

[12] La Benz, P. J. Unpublished data.

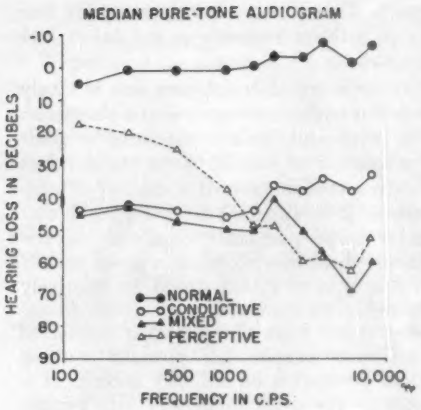


FIGURE 2

Median audiograms for 100 adult listeners

group hearing losses for speech were: normal 4.3 db; conductive 49.1 db; mixed 53.1 db; perceptive 40.0 db. Means and medians differed less than 1 db.

Articulation Scores

Figure 3 shows the articulation scores for each group for unfiltered speech and for low-pass filtering at 2000, 1500, 1000 and 500 cps. In effect an additional hearing loss of 30 db per octave has been imposed on each group for frequencies above the cut-off points successively. The fidelity of the recording equipment limited the spectrum to frequencies no higher than 5000 cps in the unfiltered condition so that no one heard effectively above this point. The normal and conductive groups which, incidentally, had the flattest audiograms also had virtually identical scores under all conditions shown. The mixed group showed increasingly poorer scores, relative to the normals and conductives, as the spectrum included higher frequencies. These had poorer hearing for the higher frequencies. The same effect is more pronounced with the perceptive group and for the same reason. Conversely, all scores became more nearly similar as the spectrum was reduced. This illustrates the fact that the width of the spectrum is related to the intelligibility of words as in the case of phonemes. The contribution to intelligibility varies for different spectrum regions, and varies according to the width of the region and the level above threshold for each. French and Steinberg[13] have shown that the speech spectrum can be divided into bands of different widths each making equal contributions to intelligibility in a linear fashion with intensity up to 30 db above threshold. In the present illustration normal listeners are able to perceive 94.2 per cent of the words with a spectrum 5000 cycles wide at 30 db above their speech threshold. The perceptive group scored only 73.3 per cent under the same conditions because the higher spectrum bands are contributing less than maximally. Increasing hearing loss for higher frequencies

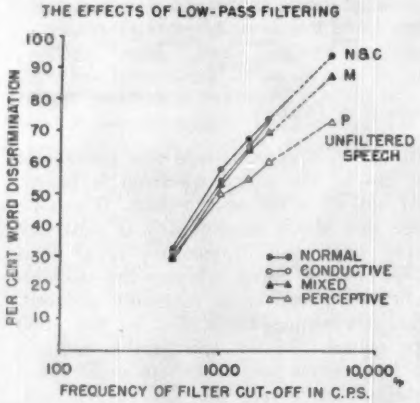


FIGURE 3

The effects of low-pass filtering on PB word discrimination compared with discrimination score for infiltered words. Values are plotted at the cut-off point for low-pass 500, 1000, 1500 and 2000 cps.

is causing the higher spectrum bands to be heard at lower intensities. Note that this is approximately the same score normal listeners achieved when the spectrum was reduced to 2000 cps, and about the same estimated score for a flat hearing loss of 30 db. It can be appreciated that similar quantitative effects can be produced in terms of frequency or intensity or both.

Undistorted speech presents more clues to perception than are actually necessary when hearing is reasonably normal. Under conditions of distortion fewer clues are available and, if severe enough, perception becomes faulty. The ability to use minimal

[13] French, N. R. and Steinberg, "Factors Governing the Intelligibility of Speech Sounds," *Journal of the Acoustical Society of America* 19:90-119, 1947.

clues varies considerably among individuals. This is indicated by increased sizes in standard deviations of the scores under increasingly difficult conditions of listening. Standard deviations of the scores for normal listeners increased from 4.4 per cent for unfiltered speech to 13.1 per cent for low-pass 500 cps. Standard deviations for the perceptive group changed only from 13.4 to 13.6 per cent, suggesting that all conditions of listening are difficult for these individuals. Interpretation should be tempered by the fact that variability for the intermediate conditions shows no clear trend. It seems clear, however, that variability increases as the conditions for discrimination become more difficult, and that this variability is not entirely dependent on differences in hearing acuity or audiogram contour.

At the risk of digression, it should be pointed out that these results are based on the performance of adults who enjoy the advantage of lifelong familiarity with the vagaries of language structure. Since not all phonemes are favored with an equal probability of occurrence in speech, perception is helped by familiarity with this probability factor. In a critical listening situation it is of some help to discrimination to know that a certain group of phonemes will most likely be followed by the consonant [d]. This is usually learned from training or experience, and it is not uncommon to find hard of hearing adults in a test situation supplying PB words with additional sounds they know they have a tendency to miss because of their hearing loss. Teaching the structure of the language to young deaf children is an important adjunct to auditory training for this reason.

The relative contributions by various portions of the speech spectrum can be illustrated by the use of band-pass filtering. This is done with a combination of high and low-pass filters which lets the intermediate part of the spectrum pass unsuppressed. As in the previous experiment, power losses were compensated so that the level of presented words remained at 30 db above the threshold for speech. But since audiometric contours varied for the mixed and perceptive groups, the effect of intensity differences is also demonstrated. For example, if the audiogram shows hearing loss increasing 10 db per octave between 500 and 2000 cps, then a band between 1000 and 2000 cps would be heard at 10 db less intensity than the band between 500 and 1000 cps if both are presented at identical levels. Figure 4 shows the discrimination scores obtained by the same groups under six band-pass conditions: 250-750, 500-1000, 750-1500, 1000-1500, 1500-2000 and 2000-3000 cps. The

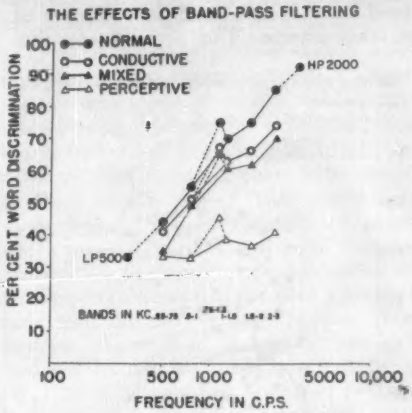


FIGURE 4

The effects of band-pass filtering on PB word discrimination. Low-pass 500 cps and high-pass 2000 cps are essentially band-pass 200-500 cps and 2000-5000 cps respectively. Values are plotted at the center of each band for the conditions 200-500, 250-750, 500-1000, 750-1500, 1500-2000 and 2000-3000 cps.

mean scores are plotted in the center of each band. The bands can be seen making increasingly larger contributions to intelligibility as frequency rises to about 2000 cps. But to maintain the linearity shown, the highest band (2000-3000 cps) is twice the width of lower bands. If higher bands of the same width were shown the curve would flatten and then descend. The scores for high-pass 2000 cps and low-pass 500 cps are included because in effect these can be considered band-pass 2000-5000 cps and band-pass 200-500 cps respectively. Higher band conditions were not explored because of the difficulty in compensating for power losses in this range. The peaks in scores for band-pass 750-1500 cps show that intelligibility is increased at any point by increasing the band width. Note that the perceptive group

shows relatively little improvement for the higher bands as compared with the other groups. This is because the contributions of these bands are being negated by progressive losses in intensity shown on the audiogram. It is significant that the perceptive group, by virtue of relatively better hearing for low tones, are presented the 250-750 cps band at a higher sensation level than were the others. Despite this theoretical advantage, the perceptives scored lower in this band than did any of the other groups. This demonstrates that

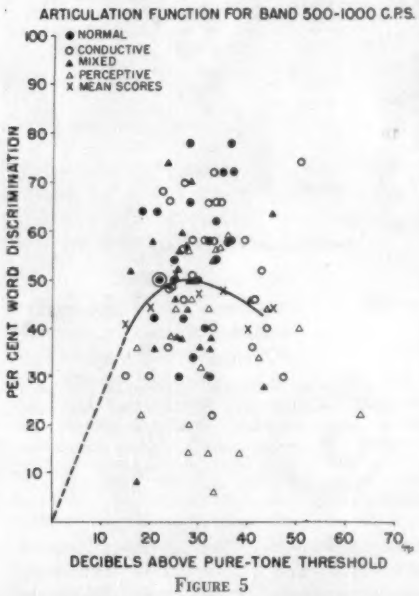


FIGURE 5

Articulation function for the band 500-1000 cps (PB words) derived by computing approximate level of speech relative to threshold for pure tones in the same spectrum region.

increases in intelligibility contribution of a spectrum band occur with increases in intensity over a limited range. This range is of the order of 30 db, and increases above this are apt to be deleterious to perception rather than helpful.

Finally, the intensity versus intelligibility relationship and the fact of listener variability are strikingly shown in Figure 5. The discrimination scores for band-pass conditions were plotted relative to the level above pure tone threshold. This was done by first converting pure tone thresholds and speech to levels re .0002 dynes/cm^2, then subtracting the average of the audiogram values at the nominal band limits from the speech level. This figure shows the results of this procedure for the band 500-1000 cps. It can be seen that by taking the mean of scores at each level above threshold, an articulation function emerges. Interestingly, the function reaches its maximum at 30 db above threshold and begins to decline. This is very likely the effect seen in the poorer discrimination of the perceptive group in the low bands despite theoretically advantageous sensation levels. Even more interesting is the extreme variability among listeners. The variability is not confined to any particular group, although the perceptive group is slightly more variable with a standard deviation of 17.3 per cent, as compared with 14.0 per cent to 14.4 per cent for the other groups. Results for the other band-pass conditions are similar except for maximal points of the articulation functions.

These data suggest the importance to perception of the frequency and intensity relationships of speech and the hearing mechanism. They also suggest that factors for perception exist in addition to these which make for great differences in perceptual ability among listeners, and which tend to frustrate predictive attempts along purely physical lines. Taking known variables into account enables estimations on the average, but these may relate to a particular individual in a highly questionable manner. And it must be kept in mind that clinically and educationally we deal in terms of individuals rather than group averages. The potential for auditory perception by any person with a hearing impairment is best determined by actual measurement after every possible benefit from amplification and education has been conferred upon him.

Book Notes and Reviews

Pediatric Years, by Louis Spekter. Springfield, Ill.: Charles C. Thomas, Publisher, 1955. 734 pages. $12.50.

In our modern society, because of the complexity of the interrelationships between events, the team approach appears to be most fruitful in investigating and handling many of our problems in medicine, psychology, sociology, education and other disciplines. In recent years the tendency has been to synthesize the knowledge of the different disciplines and place them in a framework which would be easily accessible to the different members of the team. Usually the accumulation of this information has been undertaken by an editor who would call upon representative members of different specialties for their contributions. The *Pediatric Years* represents an attempt to bring together such knowledge, but differs from the usual books in a very important way. Instead of the experts in each area contributing the information, one person undertakes the total task.

In the preface, the realization of the important part the associated specialties contributed in caring for the health of children is clearly emphasized. An objective of the book is reported as being one in which "workers in these fields have specialized knowledge and techniques which complement and supplement the efforts of physicians in their work." The book is specifically designated for "professional workers associated with pediatric medicine." Moreover, the "book endeavors to bring together from various sources comprehensive information in many aspects of child health in a form that is easily understandable and suited to the individual worker's needs." As one goes through the book, these objectives are realized only in a very limited sense.

The *Pediatric Years* is divided into six sections. Section one deals with the "optimum health of children depends upon their being born healthy." Section two treats "optimum health depends on understanding how children grow and develop and upon daily care." Section three develops the topic "optimum health depends upon care during illness." Section four handles "optimum health depends upon professional workers and facilities." Section five concerns itself with "optimum health depends upon standards of service." Section six contains "pediatric procedures and glossary." These sections are continuous since they deal with the broad general topic and are interrelated as parts of a whole.

There is no question that such a unity and continuity in the presentation of knowledge is desirable and such a task is quite ambitious and formidable especially when the contributions are the work of one individual. The *Pediatric Years* embraces 56 chapters in 678 pages. This means that each chapter is approximately 12 pages which present "various sources of comprehensive information." An examination of the chapters reveals that the book's greatest deficiency lies in oversimplification. For example, the section on hearing loss and deafness handles the mechanism of hearing, type of hearing loss, causes of hearing loss, medical and surgical treatment, hearing aids and the education of the deaf. This is no mean accomplishment in 12 pages.

The book's important reference source for this chapter is *Hearing and Deafness*, edited by Hallowell Davis in 1947. In a measure, this dates the chapter, but a very surprising phenonomen is the failure to indicate the relationship of emotional development of the children as it is related to hearing loss which Ramsdell treats at length in *Hearing and Deafness*. Chapter 44 deals with problems of behavior and personality. In this chapter the author provides information concerning abnormalities of language and devotes seven pages to speech, reading and writing, team approach and the community aspects. The professional worker will miss the psychological dynamics involved in the development of speech and language behavior. The information is very general but again suffers from the oversimplification. The same evaluation would apply to Chapter 40, "Mental Deficiency," and Chapter 45, "Patterns of Behavior," where schizophrenia is handled in one paragraph.

PERSONAL ADJUSTMENT OF THE DEAF CHILD

ENVIRONMENT AND THE DEAF CHILD

Organizes the major trends of thought in this field and examines their *basic similarities* and *differences* — and, more important, puts these beliefs to the test.

In each of the seven major areas dealt with, the literature is reviewed and the "*systems of opinion*" are put to the test of their relevance to the **PERSONAL ADJUSTMENT OF THE DEAF CHILD.**

By

STEVEN GETZ, Ph.D.

School Clinical Psychologist—Audiologist
California School for the Deaf
Berkeley, California

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"Too much emphasis cannot be made on the central fact that every phase in the work of educating the deaf, important as it is, must be correlated at all times with the object of this field of special education, viz: *to adjust deaf children to the civic, social, moral, and economic conditions of life to the end that they may be law-abiding and self-supporting citizens of the state.* The nature of educational work with the deaf is such that over-emphasis on any given phase of the work means under-emphasis on the object. Deaf children so affected lose tremendously by it. It was for the purpose of determining where the proper emphasis of time and energy should be focused during the educational life of the deaf child that this study was made."—*From the Foreword by* **Dr. Elwood A. Stevenson**

188 pages ***$3.75***

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The book does provide a good deal of general information which may be helpful to the novice, but not adequate for "professional workers" associated with pediatric medicine. Nevertheless the book covers practically all aspects of health and child care in a lucid and simple manner and provides a satisfactory glossary of terms.—*Louis M. DiCarlo, executive director, Gordon D. Hoople Hearing and Speech Center, Syracuse University.*

Ears to Hear—A Guide for the Development of Hearing Conservation Programs in Local Communities. State of Illinois Commission for Handicapped Children, 1955. 36 pages.

This pamphlet was prepared by the advisory committee on hearing conservation and rehabilitation of the state of Illinois. It presents a good comprehensive plan for setting up and carrying out such a program. A great deal of emphasis is placed upon the "team" approach—an element too often lacking in such programs.

The committee states: "Hearing conservation is a public health program usually best carried out as part of a well-rounded school health program to find children with hearing loss, evaluate their total problem and arrange for a proper remedial plan. . . . The steps necessary to achieve a complete hearing conservation program include: (1) audiometric tests to determine which children should be examined in the otological screening clinic; (2) otological examinations of the children who are referred as a result of the audiometric screening; (3) referral for medical care where indicated; (4) proper educational placement; (5) rechecking of 'borderline' cases; (6) continued testing, otological and educational follow-up."

This pamphlet will be helpful to school administrators contemplating setting up such a program, public health personnel, teachers of the acoustically handicapped, hearing societies, and technicians in the field.

One cannot help but comment, however, on one weakness in this pamphlet, and that occurs in the discussion of the technician on the testing team. "In planning for the basic testing program, technicians who are proficient in specialized techniques of group audiometric testing will be needed.

A minimum of three semester hours of approved training in audiometry is recommended—Preferred basic qualifications of a hearing conservation technician are: two years of college education and three courses in Special Education, including Education of Exceptional Children (three hours), Anatomy and Physiology of Speech and Hearing Mechanism (three hours), Audiometry and Use of Hearing Aids (three hours)." These standards seem to be quite low when one considers the demands placed upon the technician. He will be called upon to interpret the program and his findings to teachers, parents, public health personnel and pupils. One would hope he would have a more comprehensive education in the field than that described above!

The pamphlet closes with a list of thought-provoking questions under the heading "Criteria for Evaluation"—Are all of the services open to all children? Are both public and private schools included in the program? Is there an organized system of record keeping, with provision for cross-checking and analysis at frequent intervals, and for gathering significant statistical data? —*Alice M. Burtnett, Supervisor, Classes for the Deaf and Hard of Hearing, Speech and Hearing Clinic, University of Oklahoma School of Medicine, Oklahoma City.*

Think About These Things, by Jane Merchant. Abingdon Press, 1956. 96 pages, $1.50.

Jane Merchant has taken her inspiration for this small volume of poetry from Paul's message to the Philippians. Permanently bedfast in her home in eastern Tennessee since the age of 13, she has written poems for a number of years. When she was 17, Miss Merchant knew that her condition was incurable. Shortly after that she began to lose her hearing, and was totally deaf when she was 23. Undaunted by these handicaps, she has written poetry which has appeared in many publications.

Miss Merchant's first book, *The Greatest of These*, was awarded the National Pen Women's poetry prize for 1953-55. Her present book is of interest because it reflects the positive philosophy of this courageous author whose mother advised her to "not worry about what I haven't got." Another of her mother's maxims: "Can't

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never did do nothing," appears in the poem, "My Mother's Sayings."

A History of Speech Education in America. Background Studies. Prepared under the auspices of the Speech Association of America. Edited by Karl R. Wallace. Appleton-Century-Crofts, Inc., New York, 1954. 687 pages. $7.50.

A History of Speech Education in America is written for the intelligent reader interested in the informative background of all phases of speech education in America. Six years in preparation, it is the work of scholars and teachers in the history and tradition of speech as it unfolded in the U. S. It covers American speech education from colonial times to about 1925. It also discusses the English and classical sources which led to the founding of American schools. This comprehensive work is written in three parts: The heritage; rhetoric, elocution and speech; and the educational theater of the U. S. Karl Wallace, the editor, states in his preface that the main concern of this book is not with writing, but with speaking—with the use of speech in socially significant situations and the attempts to teach the art of oral communication in a formal educational environment.

Of special interest to teachers of the deaf is a section written by Dr. C. V. Hudgins in which he describes some symbolic systems for teaching the deaf. Dr. Hudgins states that with the beginning of oralism in America there was a need for a symbolic system. He explains in great detail, through description and diagrams, visible speech. He tells how the experiment in visible speech at the Clarke School for the Deaf ended in failure. The chief reasons for giving up the system were that it was too difficult to be understood by young children; it took too much of the pupils' time; and it was too complicated and easily forgotten. Dr. Hudgins continues his remarks by saying that after six years of experimentation with visible speech symbols, the Clarke School was convinced of their impracticability and abandoned them in favor of the Northampton Charts which were developed at Clarke through the efforts of Miss Alice Worcester. Numerous reasons are given showing the value of these charts. Also, there is an extensive explanation of the symbols

and of how they are developed. The complete vowel and consonant charts are printed along with an excellent description of the system. That the Northampton Charts have been a success is attested by the fact that in 1942 a survey of 37 schools for the deaf, with an enrollment of over 100 students, showed that all except two schools were using Northampton Charts.

Dr. Hudgins also gives the pros and cons of the Whipple Natural Alphabet which was developed in a small family school in Connecticut. The Whipple system was an effort to show the formation of individual speech sounds by representing graphically the physiological positions assumed by the articulatory organs as the sounds are produced. Outside of the Mystic School there is little evidence to show that this system was tried elsewhere.

Another section of this book is devoted to the development of education in speech and hearing up to 1920 and is written by Clarence T. Simon. This, likewise, should prove very interesting to educators of the deaf. Mr. Simon discusses the slow, painful path which finally led to public recognition of the need for special education for people with speech and hearing problems. Another portion of this chapter is devoted to a brief background of the steps which led to the opening of the first schools for the deaf, Gallaudet College, the growth of professional organizations, and the work of science and medicine to aid those with speech and hearing defects.

Each section of this volume includes a long and very complete bibliography which should help anyone connected with speech work. Also, throughout the discourse there are excellent annotated bibliographical notes. There is an adequate index and the type is very readable. The book is well bound and should be able to withstand ordinary handling. In looking over the list of authors who wrote the various sections of the book, your reviewer is sure that they have all made oustanding contributions to the field of speech, not only by their efforts here, but because of their other contributions. However, it would have given the volume added interest if some sort of biographical sketch of each author had been included.

In general, this book serves a very useful purpose in showing all students of speech the fascinating history which lies behind *all* the different fields of speech which we have in the United States today. *—C. Joseph Giangreco, Supervising Principal, Iowa School for the Deaf.*

Reprinted Articles

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Let Them Play

Some Informal Thoughts About a Nursery for Hard of Hearing Children

LILLAN OREMSTAD

(Mrs. Oremstad recently came to the U.S. from Norway. Her short article is a delightful expression of one person's interest in the hard of hearing child, and is being published without editing in order to preserve its original flavor and charm.—Editor)

IN January this year I came from Norway to Cleveland to see my husband who is working at the Cleveland Hearing and Speech Center. Already from the first day I got allowed to work as a volunteer in the nursery for small hard of hearing children, and I have worked there since.

When all the children on the roll list are present, there will be about twelve children in the morning nursery, and about seven in the afternoon. Sometimes the teachers and the supervisors may have rather busy days, especially when, for instance, little Mike wants to be a fisherman and tries to fish the goldfishes from their bowl. You may need one eye on each finger and one extra pair in your neck on such days.

The staff of this center takes the children in the nursery when they are between one and two years of age. That is the age in which a child usually will imitate the sounds around it and the words spoken to it. In other words, the child will begin to talk the language of its parents or other close people, if it is only able to hear it.

Therefore the teacher takes the modern techniques into her use. After testing a child she puts a hearing aid on it, that might help it to come inside the door of a world of sound and language. Even if a child might be so hard of hearing that no sound will come through in spite of a good hearing aid, that child still will be able to do lipreading, and at the age of between one and two it will usually love trying to imitate the forming of talking lips into real words with a real meaning.

Thus a growing up child, in spite of being hard of hearing, will come into a world of words and language about at the same time as it would have done if it had been a hearing child. Its store of words will, of course, be very limited compared to that of a hearing child, but it still will know that words exist in connection with objects around it.

This is an important point: If a child gets no teaching of words at that early age, he might grow up the following years without even knowing the existence of words or language at all. Without hearing a sound itself, it cannot even know that other people are able to hear. And you can easily imagine that it may be difficult for a child to change such an experience, or shall we say nonexperience, at an older age when it probably already has made a lot of wrong associations to things surrounding it. That is the main reason why this center started the nursery for very young children, and keep them in the nursery until they are about five or six years old.

I can remember my first day in the nursery. A teacher there said to me when I arrived, "Here you see the children. Let them play alone. But if you see that some one may need your help, then help them." That was the only instruction I got, so I thought to myself, "Well, since these people have the confidence in me to let me work in this nursery, I must have self-confidence and do my best. I have to look for what the experienced teachers do and besides I have to use my own brain." So I did, and it worked out fine, at least for me, and I hope for the children too.

It became a wonderful experience to me, and the work among these children has been the most interesting in all my life. Besides all the other things I have learned about hard of hearing children during these five months I have been here, I think these are the most important: The hard of hearing children are the cutest children you can ever see, and they seem to be just as happy as ordinary children, if they only get the right treatment. Thus they are also able to grow up as healthy, useful citizens, in spite of their handicap.

Leisure Reading for Deaf Children

PATRICIA BLAIR CORY
Librarian, Lexington School for the Deaf

Dress Up and Let's Have a Party, by Remy Charlip. Scott, 1956. $1.50.

This is a slight little book—slender in size and brief in content. One day while his mother was baking a cake a small boy dressed up in some pots and pans. He called up some friends and asked them to come to a dress-up party. Some ten children arrive one by one in fantastic costumes and when the cake is gone they all go home. It is as brief and simple as that, with only one line of text to a page.

The value of the book lies in the humor. Too many of our youngsters regard a book as a rather solemn object. I like one that will start children laughing. The hilariously funny illustrations of a child dressed as a ballerina in a lampshade, or another as a potato bug in an old potato bag, or one as a meatball wrapped in paper spaghetti, have the quality of slapstick—a form of humor quite popular among deaf children.

Georgie to the Rescue, by Robert Bright. Doubleday, 1956. $1.75.

Like all of Robert Bright's children's books, this sequel to the original *Georgie* has a gentle sort of humor and tells a highly "make believe" story in a perfectly straightforward way as if every word were the truth.

In this tale Mr. and Mrs. Whittaker decide to visit the city and take Herman, their wise, observant cat with them. Not wanting to be left behind, Miss Oliver (the owl) and Georgie (the gentle little ghost) go along too. Their adventures in the city, including the occasion when Miss Oliver is caught and put in the zoo, and when Georgie gets up enough courage to say "boo" to the zoo watchman, make a rather sweet story.

The handsome lithographs illustrating the book were done by the author.

The Chicken in the Tunnel, By Jane Thayer. Morrow, 1956. $2.00.

A number of Jane Thayer's books, *The Pop Corn Dragon, The Horse with the Easter Bonnet* and *Where's Andy,* have been very successful and heavily duplicated in our school library. My guess is that *Chicken in the Tunnel* will also prove both useful and popular, for this story, like the others, has humor, action and suspense.

Squawky is a scrawny chicken too thin to be taken from his New Jersey farm to the New York market. He thinks he wants to go and squeezes into a crate that is on a New York bound truck. Squawky becomes increasingly unhappy and when they reach the Holland Tunnel he is terrified. The amusing sequence of events in the tunnel, and the tale of how Squawky finally gets home, makes a good little story for the middle grades. A few of the words that can be selected to talk about while telling this story are *squawky, scrawny, scraggly, dizzy, whizzing cars, flapping, roaring, snorting, echoing* and so on.

For the convenience of *Volta Review* subscribers, the Volta Bureau has made arrangements to distribute books reviewed by Mrs. Cory. Address orders to 1537 35th St., N.W., Washington 7, D. C.

David and the Sea Gulls, a story in photographs with text by Marion Downer. Photographs, Yolla Niclas. Lothrop, Lee and Shepard, 1956. $3.00.

Large black and white photographs tell a true story about a real boy, David Boynton, who spends his summers on Monhegan Island off the coast of Maine. Here David is an interested observer of the marine life, the work of the fishermen and the lighthouses. But it is the seagulls that he loves and works for—feeding lost babies and caring for gulls that have been hurt in storms or dashed on the rocks. The gulls return his interest by becoming tame and even playful with him.

A wholesome book for boys and girls interested in nature and outdoor life, whose photographs literally "tell" the story so that poor readers may follow the sequence of events through picture interpretation. One wishes that maps, possibly in the form of end papers, had been provided so that the reader could locate Monhegan Island. Unfortunately this has not been done and

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those wishing to "ring in" a little geography will have to rely on their own maps.

You and Your Senses, by Leo Schneider. Illustrated by Gustan Schrotter. Harcourt Brace, 1956. $2.75.

As science books go this one is fairly simple and could be used for independent reading and reference by the two top classes in our Academic Upper School. With teacher presentation and assistance it could also be used in a more limited way by the younger groups of the Upper School. The chapter headings are: How you see; How you hear; How you feel things; How you smell and taste things; Senses within your body (example—hungry, thirsty, tired); and Your nervous system. The chapter on sound and hearing is simple and sensible. The black and white line diagrams and sketches are elementary and clear.

The problem of the hard of hearing and use of hearing aids is mentioned only casually in passing. Deafness, as we understand it in this field, is not commented upon.

This is essentially a beginning science book for young people. There is a brief but good index.

Was It a Good Trade? by Beatrice Schenk deRegniers and Irene Haas. Harcourt Brace, 1956. $1.95.

Perhaps it's my imagination (although I don't think so) but it seems to me that Harcourt Brace has had an extremely high proportion of original and exceptionally distinctive books in the past few years. Frasconi's beautiful *See and Say* in four languages, and Fischer's colorful *Pitschi*, are but two of the unusual Harcourt books that our children have worn to tatters.

Now another one, *Was It a Good Trade?* is also original in concept, in illustrations and in format. The small oblong shape (8 inches long x 4 inches high) attracts children of all ages, the drawings in black and white and yellow and pink are droll and completely in keeping with the nonsensical rhymes about trading.

Children in the lower and middle grades will no doubt look at the individual illustrations with interest and smiles. This is not to suggest, however, that *Was It a Good Trade?* is for younger deaf children. On the contrary, its basic use will be in the upper grades in the hands of a skilled and

imaginative language teacher or literature teacher. A few examples of language taken at random will drive home this point:

"I had a little knife.
I traded for a wife."

. . . . . .

"The shoe—it had no mate—
I traded for a slate.
And what I drew on that
I traded for a cat.
The cat she had some kittens
I traded them for mittens."

. . . . . .

After going full circle, the tale concludes:

"so now I have my little knife,
My little wife,
And I will keep them all my life

. . . . . .

Well, what've you got to trade?"

Little Dog Lost, Little Dog Found, by Esphyr Slobodkina. Abelard-Schuman, 1956. $2.50.

Slobodkina is one of the newest and most original talents, both as an author and illustrator, that has appeared recently in the field of children's literature. We have her *Caps for Sale* and *The Wonderful Feast* and have found them useful in special and rather limited ways. Fortunately this new book will be useful in many ways from nursery school through preschool and the lower grades. The story line is direct and simple—Johnny had a little dog; they enjoyed playing together; the dog gets lost and is picked up by the dog catcher; the dog, after an interlude, is found again for the satisfying ending so dear to a child's heart.

The illustrations, by the author, are large and colorful and are somewhat posterlike both in their delineation and in the use of bold, bright colors. This will be wonderful for the child to look at individually and for telling, orally, to groups.

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HEARING AID GARMENTS

(*Continued from page 392*)

hold the hearing aid securely, but meets the need for something to wear for Sunday school and similar occasions when the child is not too active. This style lends itself to a variety of material such as silk, felt and wool. Judy's mother improved upon this pattern by fashioning a bolero with a neckline to fit under a dress collar where she pinned the two front corners.

Jan models another pinafore style that could be executed in peasant motif. This requires a snuggly fitted dress with a set-in belt and buttons at the shoulders and waistline. Pearl buttons with long shanks are fastened to the dress with safety pins (from the wrong side).

Timmy has a vest of gray denim made from a commercial patern. It can be worn open or closed, and has elastic at each side to insure a snug fit at the waistline. The pocket opening is on the under side of the vest so that the cord is less likely to be caught.

The final evaluation of the experiment brought out several important points. While pockets for the aid must be large enough to allow easy access to the volume control, they should be small enough to hold the aid securely. The opening over the microphone must be accurately placed for the particular aid. Best results were obtained if the aid was held securely in position at the center of the chest, or on the side opposite from the ear in which the ear insert is worn. Pockets made of elastic were less satisfactory than those made of cloth.

It was also found that a variety of styles and colors was desirable in order to permit the child to select a garment to suit his clothing for the day. A garment that the child can put on and take off by herself is to be preferred to one that fastens in the back or under the arm.

THE CHRISTMAS STORY

(*Continued from page 396*)

KING 3: Come, let us adore Him.

(*The kings mount "camels" and ride about the stage looking at the "star"*)

SCENE VI

(*This scene is a tableau. Mary and Joseph kneel by the crib with the Infant. A clothes basket makes a good crib. Crib Angels surround crib. Shepherds walk in slowly, bow and kneel. The kings walk in majestically, bearing gifts. An appropriate prayer by all or some is a fitting close.*)

(Records: "Silent Night" and "Away in a Manger!")

TRACY CORRESPONDENCE COURSE RESULTS—MONTAGUE

(*Continued from page 395*)

the situation. We are now concentrating on special education for her. We in no way feel sorry for ourselves or for Ann. We have become aware that some awfully fine parents are in the same position. We have lost all our prejudices. We realize that deafness is no respector of race, creed, color or religion. I think our Austin Preschool Hearing Center will be one of the first schools in Texas that has no discrimination. This was arrived at without any force by the Supreme Court decision. We, the board members, wanted it to be this way."

There is a mother in Mexico City who has six children. You would not know this to look at her, for she doesn't seem a day over 25. Her second child, seven years old, is deaf, and this mother has done a wonderful job with the little girl's training. Not only that, she has helped other mothers and has started a strong movement for an oral school for the deaf in Mexico. She has written a very helpful booklet in Spanish, with much information for the parent of a deaf child. She has taught her daughter to use a hearing aid and the little girl is beginning to speak. She has a considerable lipreading vocabulary. She is one of the best behaved children I ever saw. I don't say the Tracy Correspondence Course accomplished all of this, but I do say it helped. The mother is here with us now. She came all the way from Mexico to attend this meeting. She is a very fine example of what parents can do when they know how to start.

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1887, published by Edgar S. Werner, New York. 102p. Cloth $2.00

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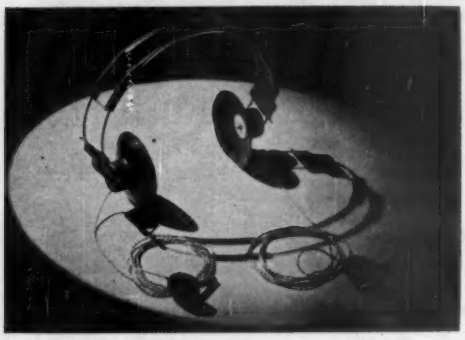

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NEWS

Dr. Raney Accepts New Position

Dr. J. A. Raney, superintendent of the Indiana State School for the Deaf, is retiring from the school on November 16 after 21 years of work in the teaching profession. Dr. Raney will be associated with the Indianapolis Valley of the Scottish Rite after November 19, and will take over the office of executive secretary next May.

Volta Bureau Gifts

Contributions recently presented to the Volta Bureau, and not previously recorded, include those of: Mrs. Joseph Antonicelli, Mrs. John S. Balfour, Richard A. Benoit, Margaret Bodycomb (in memory of Mrs. Murray Wheeler), Mrs. Mattie L. Buchanan (in memory of Mrs. Mary Conrad Coleman), Mr. and Mrs. Marion E. Bullock, D. N. Gaudette, W. Hessey, Mrs. William Hutcheson, Mrs. F. E. Morency (in memory of Henry Lischer), Jeanette Riker, Lyman Smith, Mr. and Mrs. Ely Trachtenberg, Mrs. Charles Valentine (in memory of Mrs. Mary Conrad Coleman), and Mrs. Ethel E. Vixie.

New Steps at the Volta Bureau

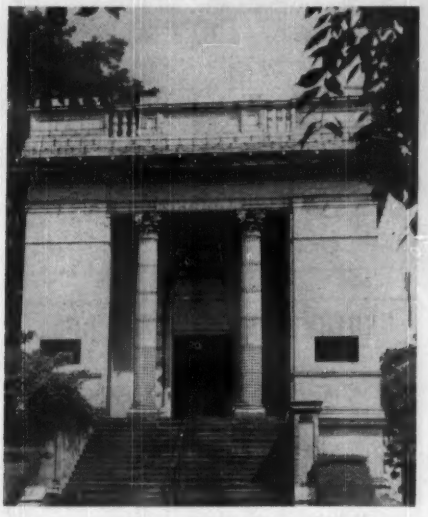
The long flight of steps in front of the Volta Bureau is now in service again. Visitors and members of the staff have had to use the side entrance to the building for several months while the stairs were being replaced. The flagstone steps, in use since the building was erected in 1893, were found early this year to be in a dangerous condition. The new steps are reinforced concrete, overlaid with New York bluestone to meet requirements governing the style of buildings in Washington's historic Georgetown area.

It is interesting to note that the Volta Bureau bulding has been in service for 63 years. A small building of buff-colored brick and stone, it was built in the neoclassic style of the libraries of the 1890's. It was designed and erected under the direction of Dr. Alexander Graham Bell to house the Volta Bureau.

In 1887 Dr. Bell started the activities of

NOTES

the Volta Bureau by placing his collection of books on deafness in a large room of the carriage house behind his father's home on the corner of 35th Street and the street which has since been named Volta Place. This room also served Dr. Bell as a laboratory. The collection of books and the work of the Volta Bureau outgrew these quarters, and it was at this time that Dr. Bell planned and started the present



building located across Volta Place from his father's home.

The building was modernized and rededicated in 1950. At this time little change was made in the basic construction.

Members visiting Washington are always welcome at the Association headquarters at 1537 35th Street, N.W.

Tracy Clinic Completes New Wing

The John Tracy Clinic in Los Angeles held an Open House on October 7 to mark the opening of a new wing which has just been completed. Members of the Association who attended the Summer Meeting in June were entertained at the clinic and saw the new wing which was then under construction.

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